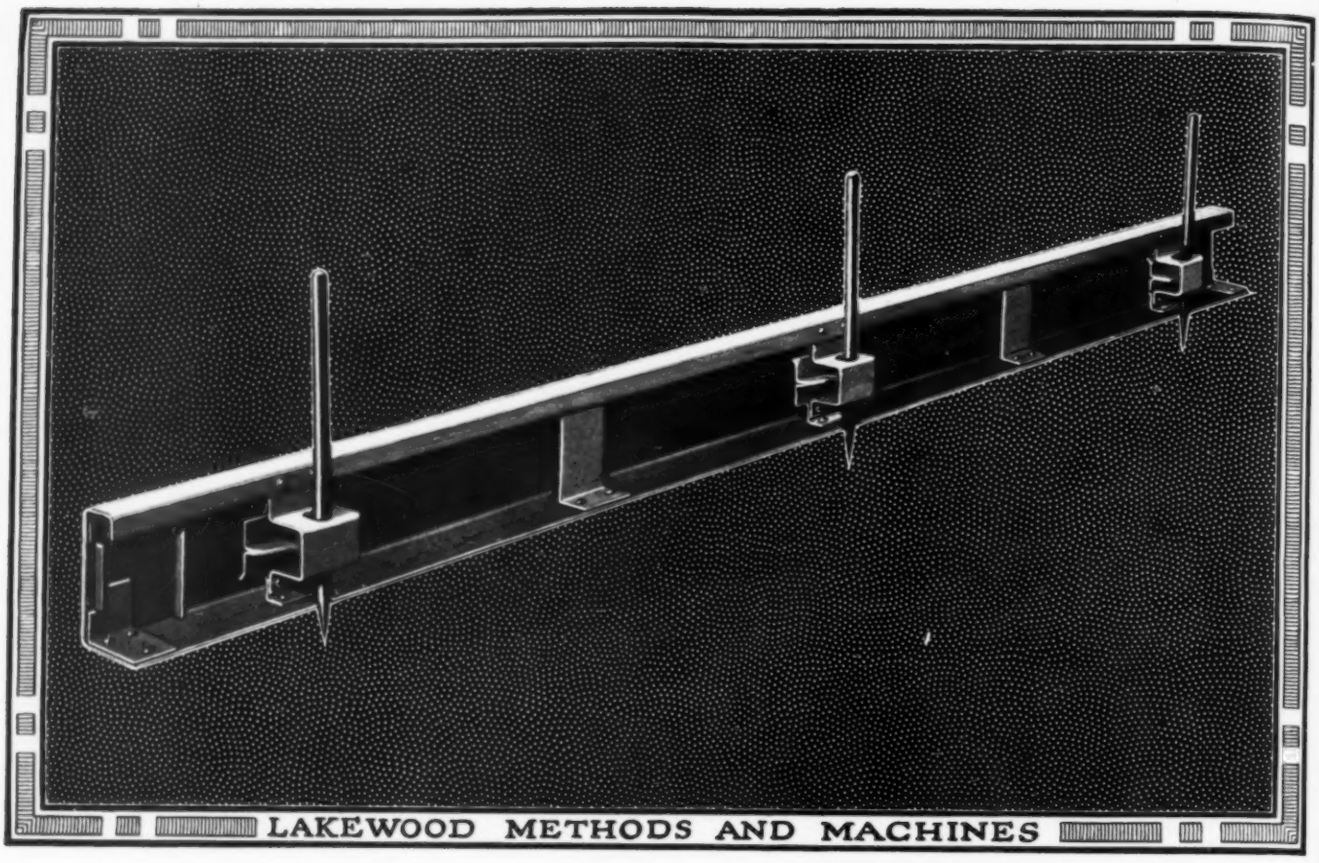
Successful Methods

Construction - Road Making - Engineering - Industrial - Mining

Vol. 4. February 1922. No. 2



Lakewood Road Forms Cost More to Make But Less to Buy

Each 10 ft. section of Lakewood-Hotchkiss forms has the top flange supported at *five* points. The top is "true as a die" and strong as a bridge.

In many other ways Lakewood-Hotchkiss forms are *better* steel forms—the stake clamps, wide bottom flange, the deep turn-down section of the top, the spot-welding on the top flange. Though they cost more to make, they cost less to buy.

Ask for a copy of Bulletin No. 36.

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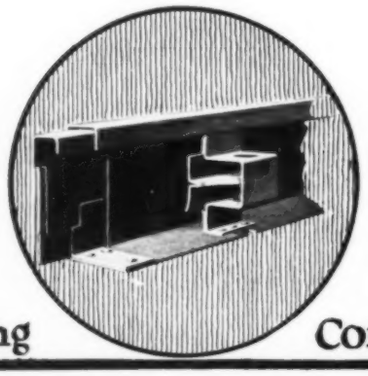

The Lakewood Engineering Company, Cleveland U.S.A.

Successful Methods

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Getting Up to Full Production

ONE of the big copper companies has announced that it will resume mining operations immediately in Montana. This company also has stated that from twelve to eighteen months will elapse before its plants can be worked to capacity output. The same thing is happening in the Missouri zinc mines. Concerns starting up in that district expect it will take as much as two years before some of their mines can reach full operations again.

This long delay in securing capacity output has nothing to do with market demand. It is due only to mechanical and organization problems. The same slow pick-up in operations also is unavoidable in most other industries. Experienced construction men know how long it takes to get to going full blast again on a job which has been completely stopped, and the organization disbanded.

In the face of this generally known operating situation, most construction men hold off until the last minute each spring before they start things moving. Opening up new quarries and new sand and gravel pits is one good example. It takes time to get such a layout into production. Very often it is weeks after an actual start is made before anything approaching full capacity can be obtained. And, still, men will wait until March before they even order quarrying or excavating machinery which they expect to have on the job and running full capacity by May. In most cases this simply cannot be done.

Right now, to-day—is not a moment too soon to start things in motion so full capacity can be obtained very soon after the construction season opens. There will be plenty of delays that cannot be foreseen. Your organization problems will be enough to solve. Worries about plant and equipment that are not ready to run because you waited too long to get them on the job can be avoided if you get busy now.

That Shortage of Material Again

LAST month we made some innocent remarks about a probable shortage of certain construction materials this coming season. Some of our friends apparently questioned our sanity for having such ideas.

Now we are going to speak right out in meeting on the subject.

The odds are about 20 to 1 that there will be a nation-wide coal strike by April 1. If it comes it will be a finish fight, with no quarter asked or given. How much will such a strike mean to your work?

But leave out the practical certainty of a coal strike. There are $800,000,000 available to be spent in the construction of roads in 1922. Nobody knows how much the cities of the country have on hand to spend for streets, sewers, waterworks and other municipal improvements. Tax-free bond issue money is plentiful. At the same time, the whole country is in the midst of a real boom in small buildings. Study the figures in your own locality, if you doubt this last statement.

Now put all these things together. Forget the supply men who have been following you up regularly. Just count up and see whether there will be enough of the materials that you will need to supply the wants of everybody all at the same time. Probably there will be enough of most materials, provided that everything goes just right. But look back three, five, seven or ten years. How many times have things gone just right for you on material deliveries? How many times have you had a job held up because you coudn't get shipments?

Maybe you are not fixed to store materials. You can at least get your orders in now. Many of the material men will protect you against a drop in price between now and the delivery date, if you place your orders now. Besides, the prices of most construction materials are hardening. And if there is a real shortage material prices are certain to go up.

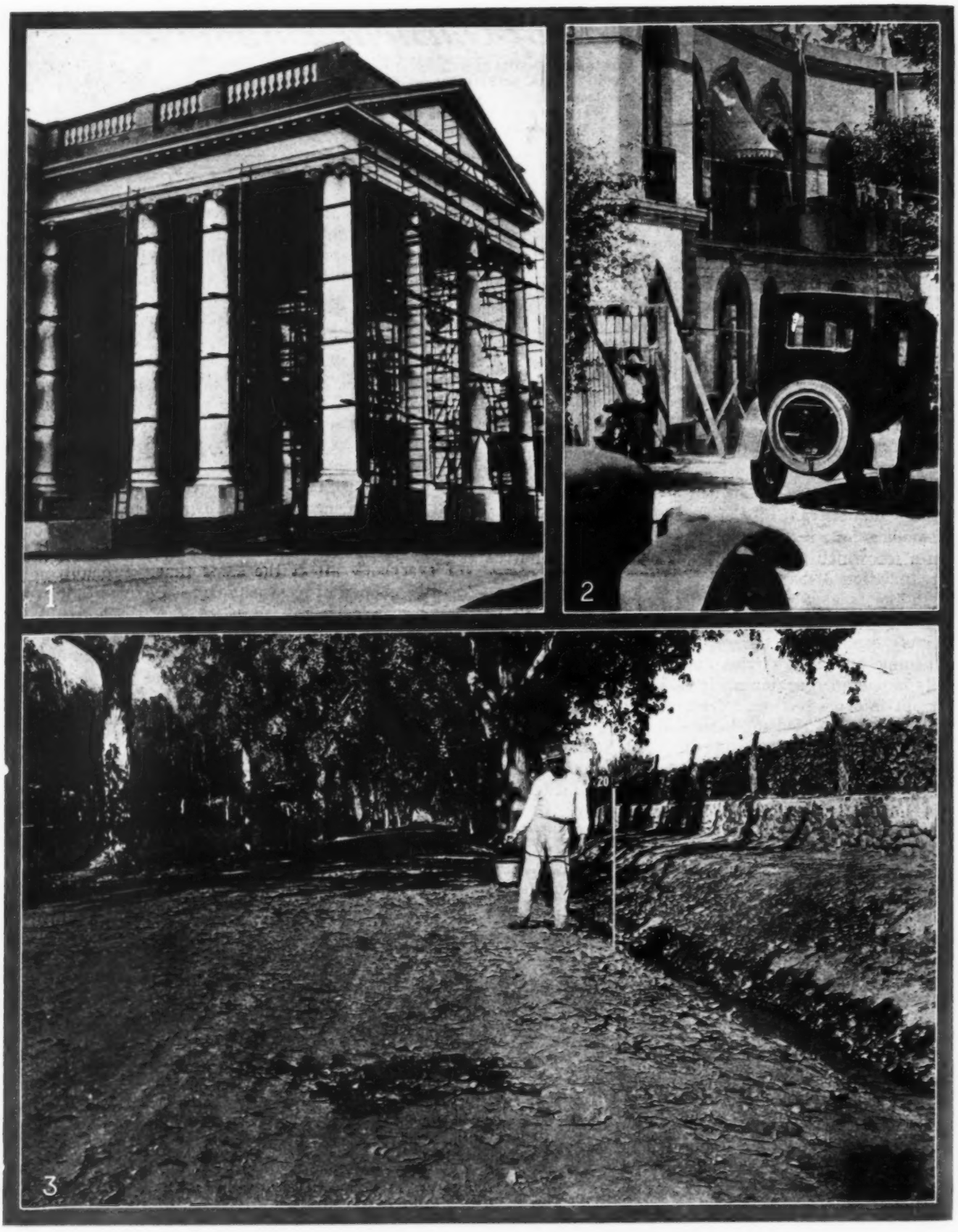
Keeping the Public Sold

FEW construction men give a thought to the attitude of the public toward their jobs. That is the reason why so many of them have frequent troubles with the public.

Many such troubles can be avoided merely by keeping the public posted on what you are trying to do and what you are up against. This usually can be done by giving the local newspapers a little information about your job once in a while.

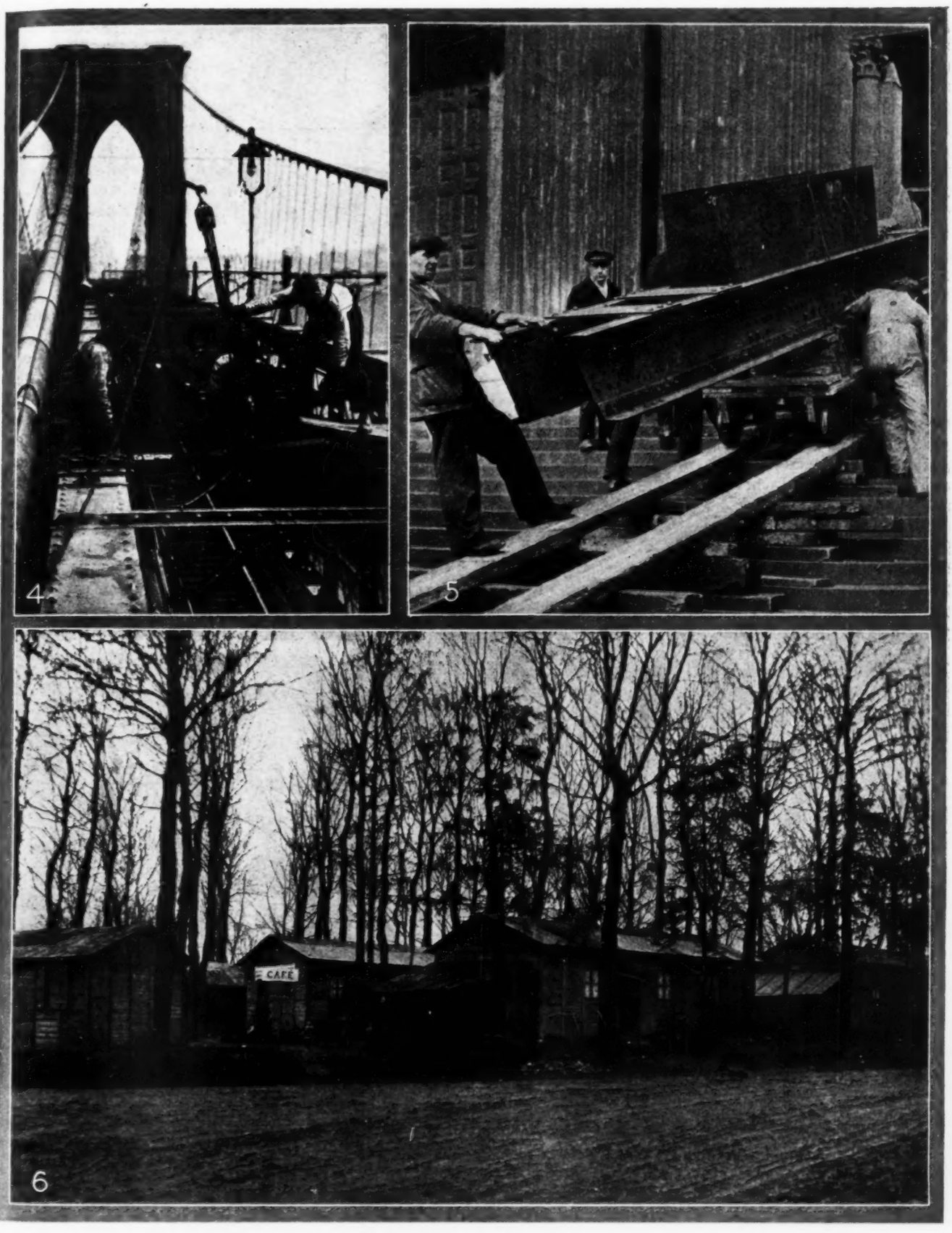
Instead of fighting the public get them on your side. It is easier to do that than to have them against you. You need only to get the right viewpoint toward publicity and use a little horse sense in what you say and how you say it.

Maintenance Must Follow



1—The White House at Washington gets a new coat of paint to keep it in good repair. © *Keystone.*
2—The Mexican White House also needs a little refurbishing now and then. © *Keystone.*
3—One man with his bucket and shovel keeps a long section of this road in Mendoza, Argentine, in good shape. The number on the pole is his identification mark so that the inspector riding by will know that he is on the job. © *Keystone.*

In Wake of Construction



4—Driving in a new pin in one of the chords of the Brooklyn Bridge. © *Keystone.*

5—St. Paul's Cathedral in London recently was repaired. This photograph shows some workmen taking a big girder into the building. © *Keystone.*

6—The work of reconstructing Verdun is still going on. This photograph shows some of the temporary buildings which are being used until the famous city is its old self once more. © *Keystone.*

HAULING ROAD MATERIALS THROUGH A TOWN

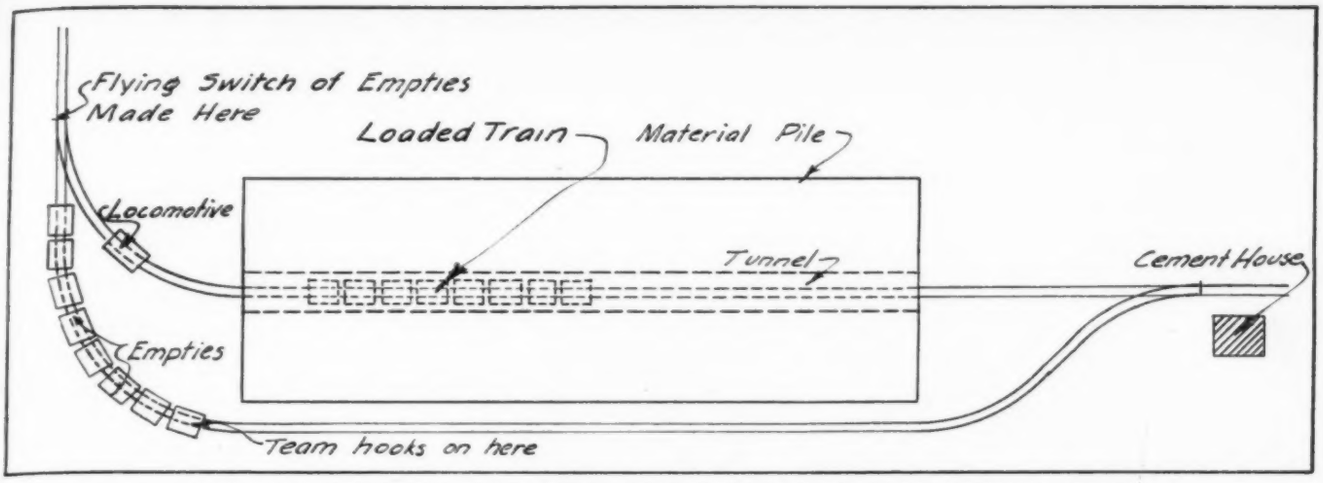
Contractors on Section of Bankhead Highway Keep Citizens of Tupelo, Mississippi, Interested in the Work

THE photograph on the cover of this issue of SUCCESSFUL METHODS shows a train of batch boxes being hauled through the main street of Tupelo, Lee County, Miss. They are part of the plant of the Mills Engineering Construction Company, which is building a 5-mile section of the Bankhead Highway. The location selected for the material yard made it necessary to haul the aggregates straight through the town, a proceeding which excited the curiosity of the citizens until they became used to the sight of trains passing up the main street past the Confederate Monument and on out to where the paver was at work.

Work began on this job in the fall of 1921 and about 5 miles already have been built. The road is 18 ft. wide, 6 in. thick at the sides and 8 in. at the center. A 1-2-3 mix is used.

The tunnel system of storing material is used and the tunnel is located in the center of the job. The aggregates are unloaded from the railroad cars by a shipyard crane and stored over the tunnel, which is about 250 ft. long, is lighted by electricity and is large enough for a team to operate in. Eight-car trains are used, hauled by 6-ton gasoline locomotives, and there are a number of 5 per cent grades on the route. The eight-car trains have had no difficulty, however, in making these grades. The cement is loaded by measuring hoppers which automatically dump the material into the proper compartments of the batch boxes and the entire operation of loading each train with sand, pebbles and cement takes only 8 min.

TWO VIEWS OF THE MATERIAL YARD NEAR TUPELO. THE UPPER PHOTOGRAPH SHOWS THE SHIPYARD CRANE USED FOR UNLOADING AND THE LOWER PICTURE GIVES A VIEW OF THE TUNNEL.



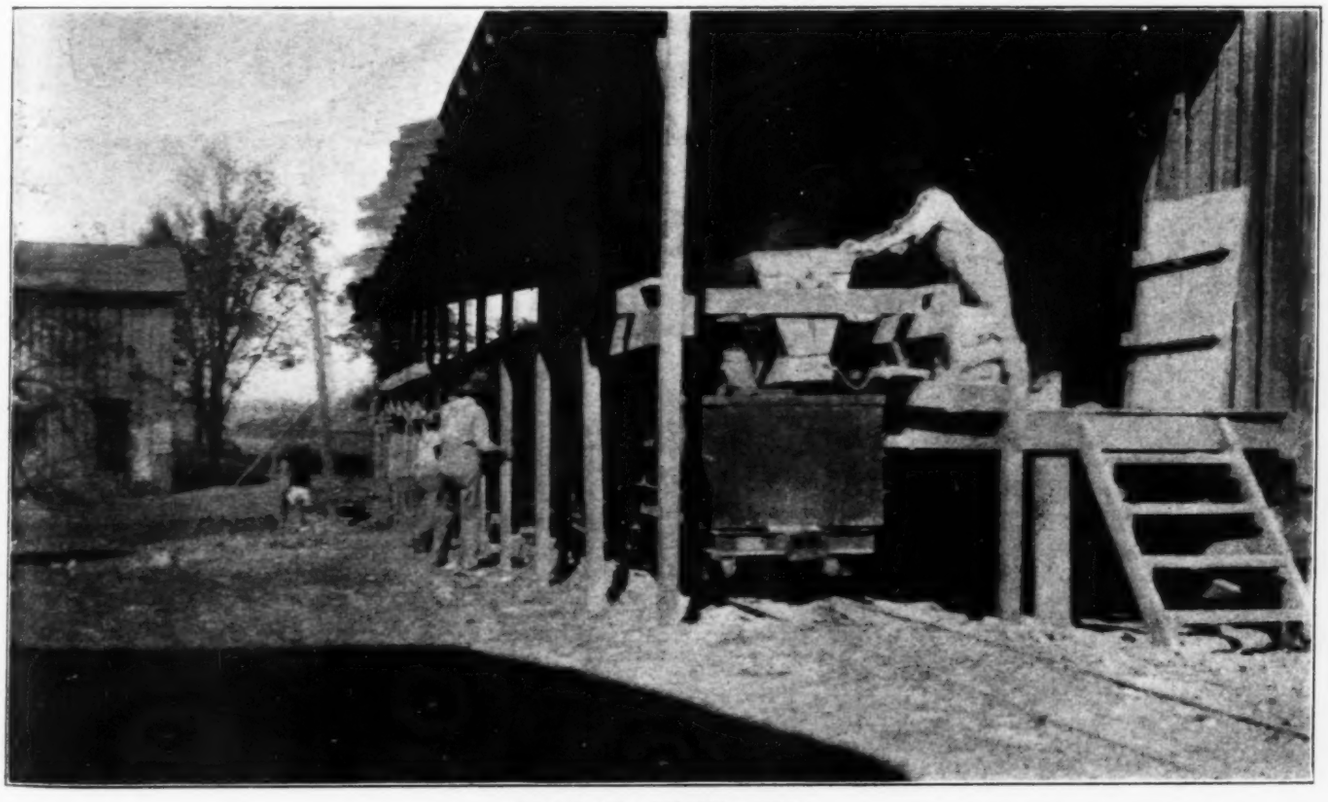
THIS DIAGRAM SHOWS HOW EMPTY TRAINS ARE HANDLED BY FLYING SWITCH

This operation has been speeded up by the use of a flying switch at the tunnel, a diagram of which is shown. As the train of empties comes into the yard, the locomotive is cut loose and the cars are shunted to a siding, where they are picked up by the team and pulled to the cement house at the other end of the tunnel. In the meantime the locomotive hooks on to a loaded train, which is waiting, and is away again in less than half a minute.

For the actual laying of the concrete a mechanical subgrader, a paver and a finishing machine are used. The superintendent in charge of the job is P. E. Mills. Tupelo happens to be the home of W. D. Robins, State Highway Commissioner of Mississippi, and Mr. Robins takes a great personal interest in the progress of the work.

The photographs which accompany this article show details of the material yard. As may be seen in the upper photograph on the opposite page, the shipyard crane is mounted on standard-gage trucks so that it can be moved easily along the length of the 250-ft. tunnel. The lower photograph on the opposite page shows the mouth of the tunnel from which a loaded train is being pulled by team, and in the background the crane is unloading a car of gravel. The picture at the bottom of this page gives a good idea of the measuring system for loading cement. The man dumps the bags of cement into the measuring hopper which discharges directly into the cement compartments of the batch boxes.

Work on this job is progressing through the winter months.



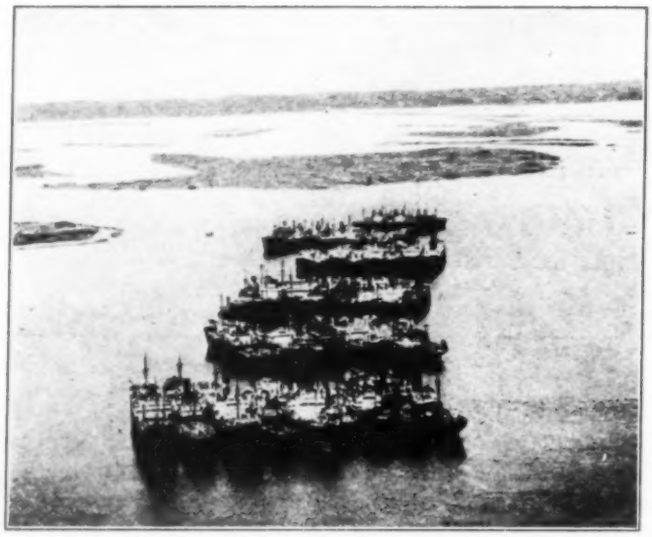
TRAIN AT CEMENT SHED

NEW YORK ADDS TO ITS PORT FACILITIES

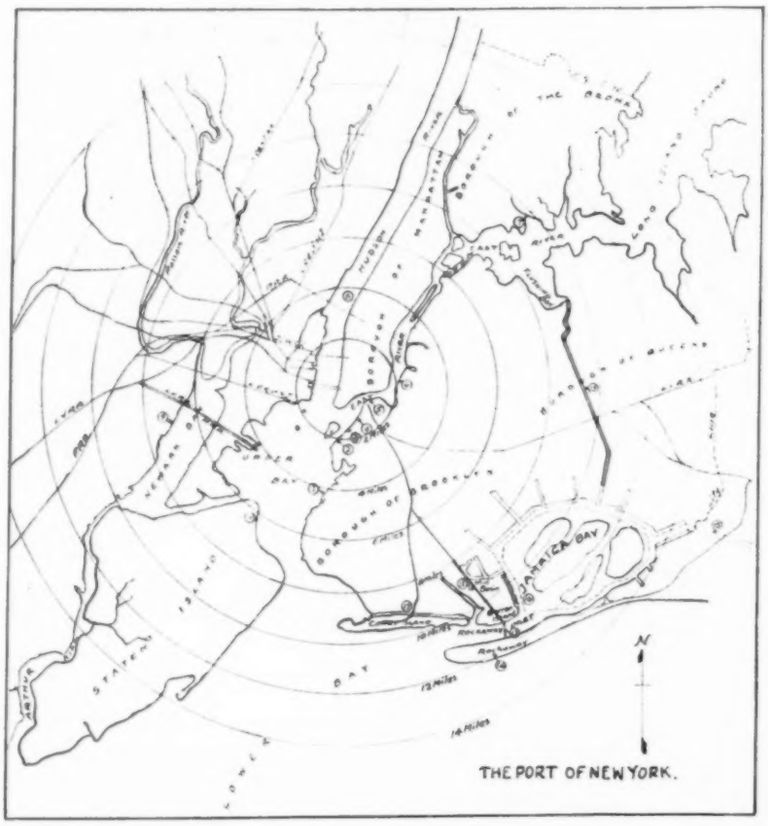
Development of Jamaica Bay Will Furnish Room for Increasing Commerce

TO relieve the weight of traffic under which the Port of New York with its docks and port facilities designed for the commerce of half a century ago is staggering, Jamaica Bay, a great natural harbor, lying at New York's very doorstep and nearer to the ocean than New York Harbor itself, is now being developed. Jamaica Bay, as shown on the accompanying map, is a natural landlocked harbor, 5 miles from the ocean entrance and only 8 miles from the city's financial district. Lying wholly within the limits of the City of New York, it covers an area of 32 square miles and is capable of supplying 156 miles of additional dockage to the harbor of New York.

In addition, its development will furnish a terminal for the Flushing and Jamaica Bay Canal, a shorter route for the New York State Barge Canal, which would permit barges to reach the seaboard without going through the congested section of the main harbor or out into the lower bay. By means of a tunnel under the Narrows, which will shortly be a reality, the railroads now terminating in New Jersey can deliver freight directly by rail alongside of docks for transfer to ocean steamers. The necessary construction work will itself reclaim and develop thousands of acres which now are under water. Inasmuch as the industries and conditions which will be affected include practically every commodity produced in the United States, and as the industrial and commercial development involved is of great magnitude, the nature of this vast project, as well as the construction methods used, are worthy of attention.



FIFTY SHIPS TAKE UP ONLY A SMALL SECTION OF THE VAST AREA OF JAMAICA BAY



THIS MAP SHOWS JAMAICA BAY IN ITS RELATION TO NEW YORK CITY, WHICH MAY BE SEEN IN THE LOWER RIGHT-HAND CORNER. THE FOLLOWING SYMBOLS DESIGNATE POINTS OF INTEREST: 1, BUSH TERMINAL; 2, ATLANTIC TERMINAL; 3, BALTIC TERMINAL; 4, FULTON TERMINAL; 5, JAY STREET TERMINAL; 6, EASTERN DISTRICT TERMINAL; 7, BRONX TERMINAL 8, FORTY-FOURTH STREET PIER LOCATION; 9, NEWARK IMPROVEMENT; 10, AMERICAN DOCK & TRUST COMPANY; 11, FLATBUSH AVE. EXTENSION; 12, CONEY ISLAND SHIP CANAL; 13, FLUSHING AND JAMAICA BAY CANAL; 14, FORT TILDEN; 15, SOUTH SIDE LONG ISLAND CANAL; 16, AUTHORIZED CITY PIERS

Omitting for the moment the ultimate development of the project, the present plan provides that the Federal Government construct and maintain an entrance channel 1500 ft. wide and 30 ft. deep around the westerly and northerly side of the bay, a distance of 8 miles. The State of New York became a partner in the cooperative agreement by ceding to the city for the purpose of the development all the land under water around the bay and all the hassocks and islands in the bay, a total of more than 16,000 acres.

The City of New York has adopted plans for the construction of fourteen 1000-ft. piers fronting the main channel, as shown in the accompanying map, at the Barren Island-Mill Basin end of the bay, and has authorized the building of these at an estimated cost of

$7,500,000. An alternative plan for the construction of 6 piers 2000 ft. long and 800 ft. wide also has been prepared by the Department of Docks, which provides for supporting warehouses to be equipped with the most modern freight handling machinery.

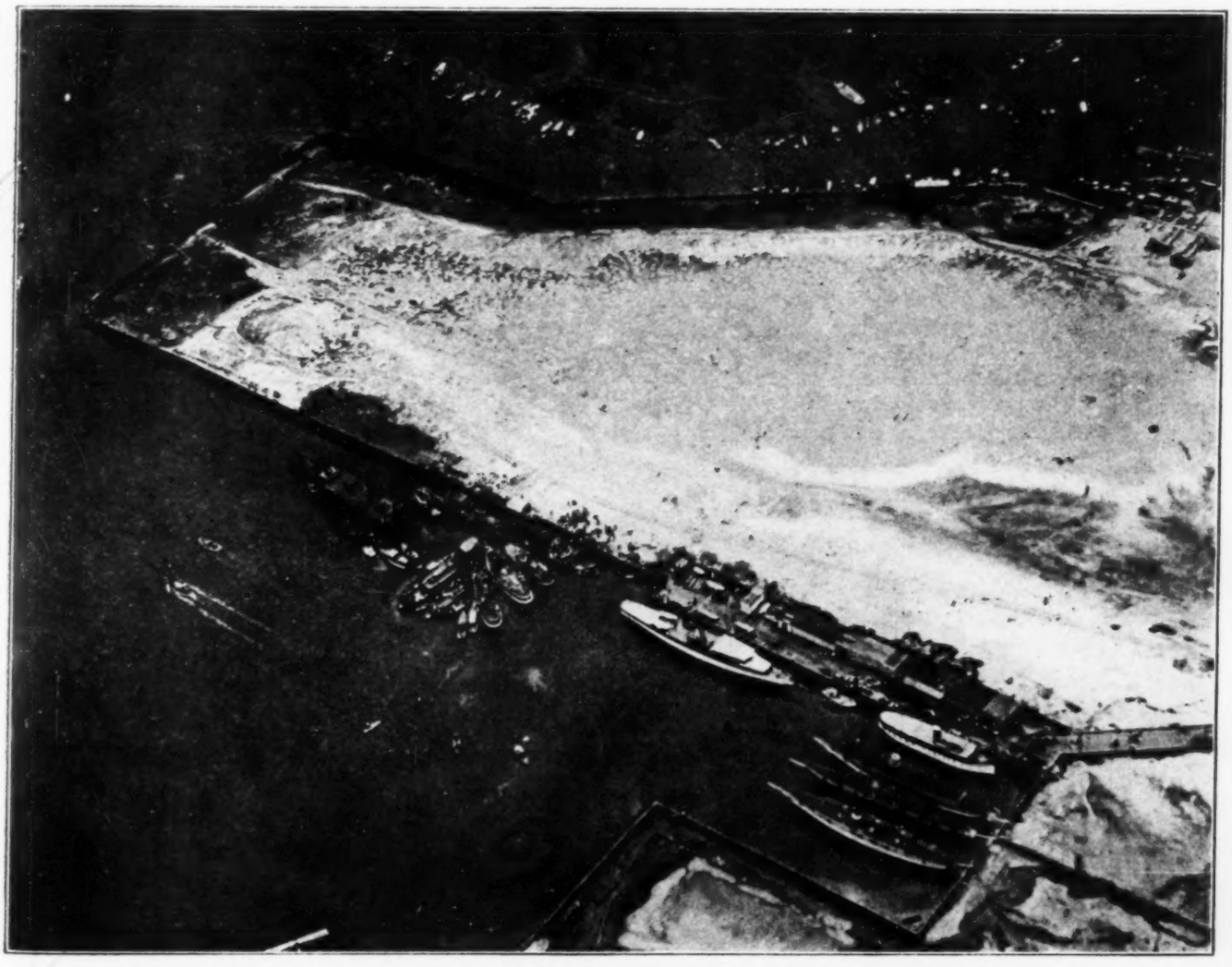
In connection with the reclaiming of the lowlands, Flatbush Avenue is to be extended to Barren Island, a distance of 2¼ miles. The contract for this extension has been let to Smith, Hauser & MacIsaac, Inc., who expect to complete the work in 1922. For filling in the area between Barren Island and Mill Basin, hydraulic dredges are being used and a bulkhead is being thrown along Mill Basin. This work is now in progress, the contract having been let to the George B. Spearin Company of New York City.

A sketch of the bulkhead, which is known in the Department of Docks as a bulkhead platform, as well as the detail of the reinforced concrete sheet pile which is being used, is shown in one of the illustrations. The design was made by the Department of Docks and consists of precast concrete piles averaging 47 ft. in length, all of which are jetted to place. On the land side of the bulkhead a row of tongue and grooved reinforced concrete sheet piles are placed, which confine the material which the dredges pump in from the basin. The dredging contract was let to the Atlantic Gulf & Pacific Company. The sheathing, which in this design is placed on the land side, considerably reduces the length of the piling required. As shown in the sketch, all piles have four ⅞-in. square rods which project into the reinforced concrete beams. The piles have ¼-in. round hooping.

One of the illustrations shows the method which the Spearin company is using to cast the piles on the completed deck. Steel forms are used and alternate piles are cast. After a sufficient curing period forms are removed and the intermediate piles are cast without the use of any forms whatsoever. Bond between the piles is prevented by grease. This materially cuts down the amount of forms required.

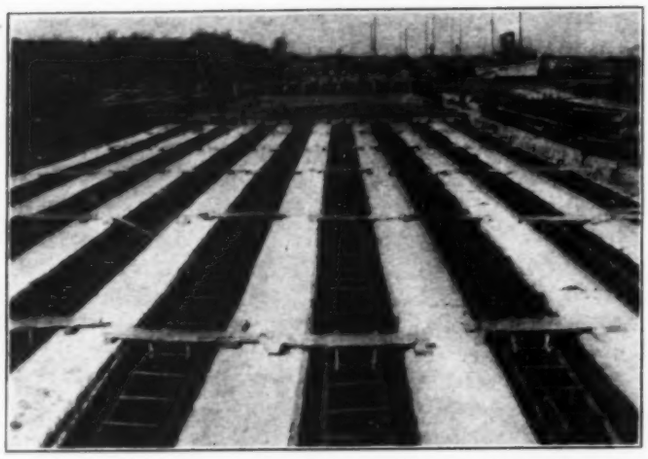
A floating concrete plant, consisting of a 1-yd. mixer and steel tower with steel chutes, handles the concreting of the piles, as well as of the concrete deck. A floating pile driver plant handles concrete piles and jets them into place. Two 200-lb. jet pumps operated from a pile driver are used and from 10 to 15 piles are driven in 8 hr. Fifteen to twenty piles are cast per day and 30 days are required for curing.

An interesting feature of the pile work is the method the department is using for waterproofing their bearing piles. After the piles are cast and cured, the piles are coated with hot pitch 9 ft. below the



AN AEROPLANE VIEW OF MILL BASIN, SHOWING SECTION OF RECLAIMED LAND FILLED IN BY THE SUCTION PROCESS. THIS PHOTOGRAPH WAS TAKEN BY THE UNITED STATES NAVAL AIR SERVICE

head of the pile, or a distance of about 2 ft. below the water line. Five plys of felt and burlap are applied and also coated with hot pitch. Around this is wrapped a sheet of expanded metal, over all of which concrete is shot on by means of compressed air. This is believed to be the most effective method of preventing spalling off of the concrete due to freezing action between the high and low tides.



CASTING PILES FOR THE BULKHEAD PLATFORM. THE PROCESS IS DESCRIBED ON PAGE 7.

All the reinforcing steel for the job was received by boat from Buffalo without rehandling. The shipment came by way of the New York Barge Canal direct to the bulkhead platform at a saving of about $2.50 a ton in freight, and shows the possibilities of Jamaica Bay.

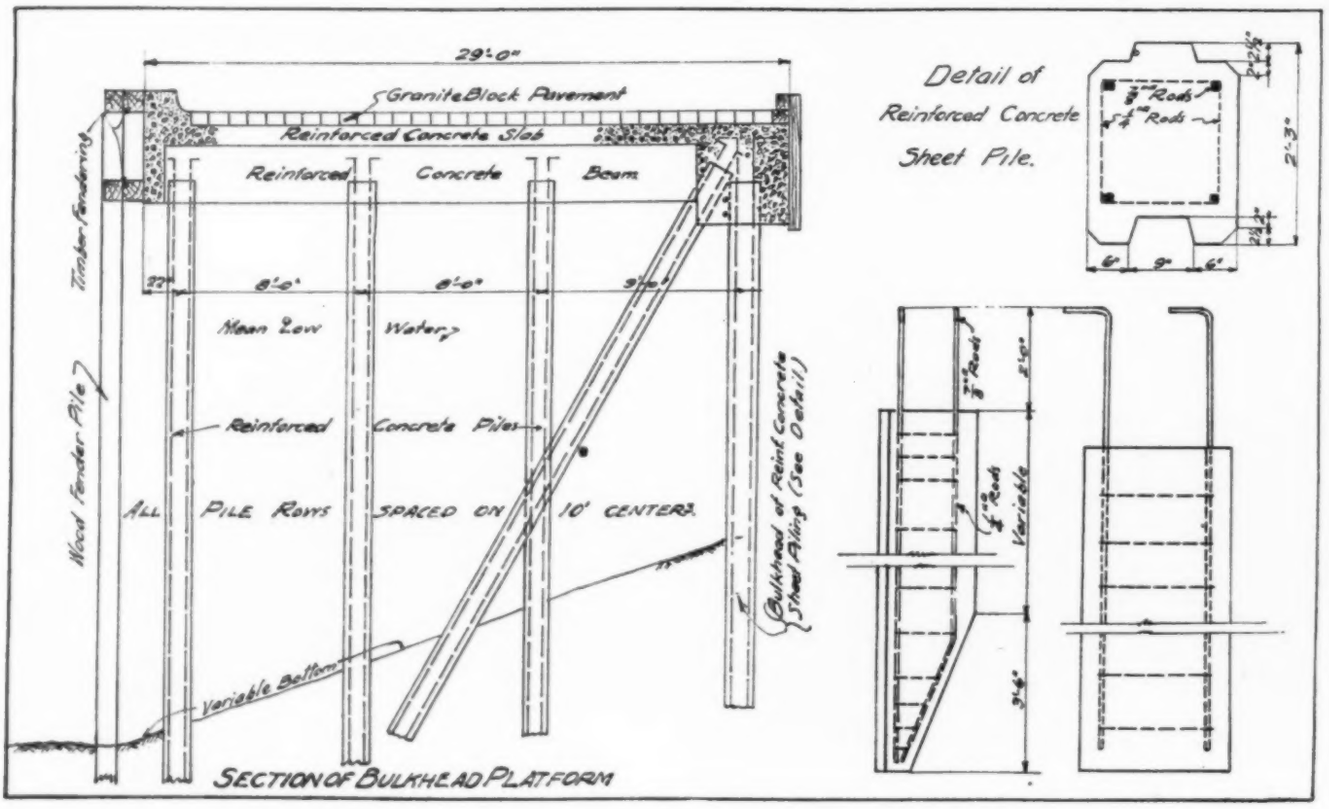
If the Flushing and Jamaica Bay Canal, which is part of the development plan of Jamaica Bay, had been completed, this shipment of reinforcing steel would have come by a still more direct all-water route at a still greater saving in freight.

Additional proof of the possibilities of Jamaica Bay lies in the fact that the United States Shipping Board already has utilized it for the anchorage of 120 of its idle merchant vessels at one time. In its undeveloped state its entire mercantile fleet could find ample wharfage and anchorage space within its broad limits. One of the photographs shows a group of about 50 of the Shipping Board's boats in the bay where they were anchored in 1921.

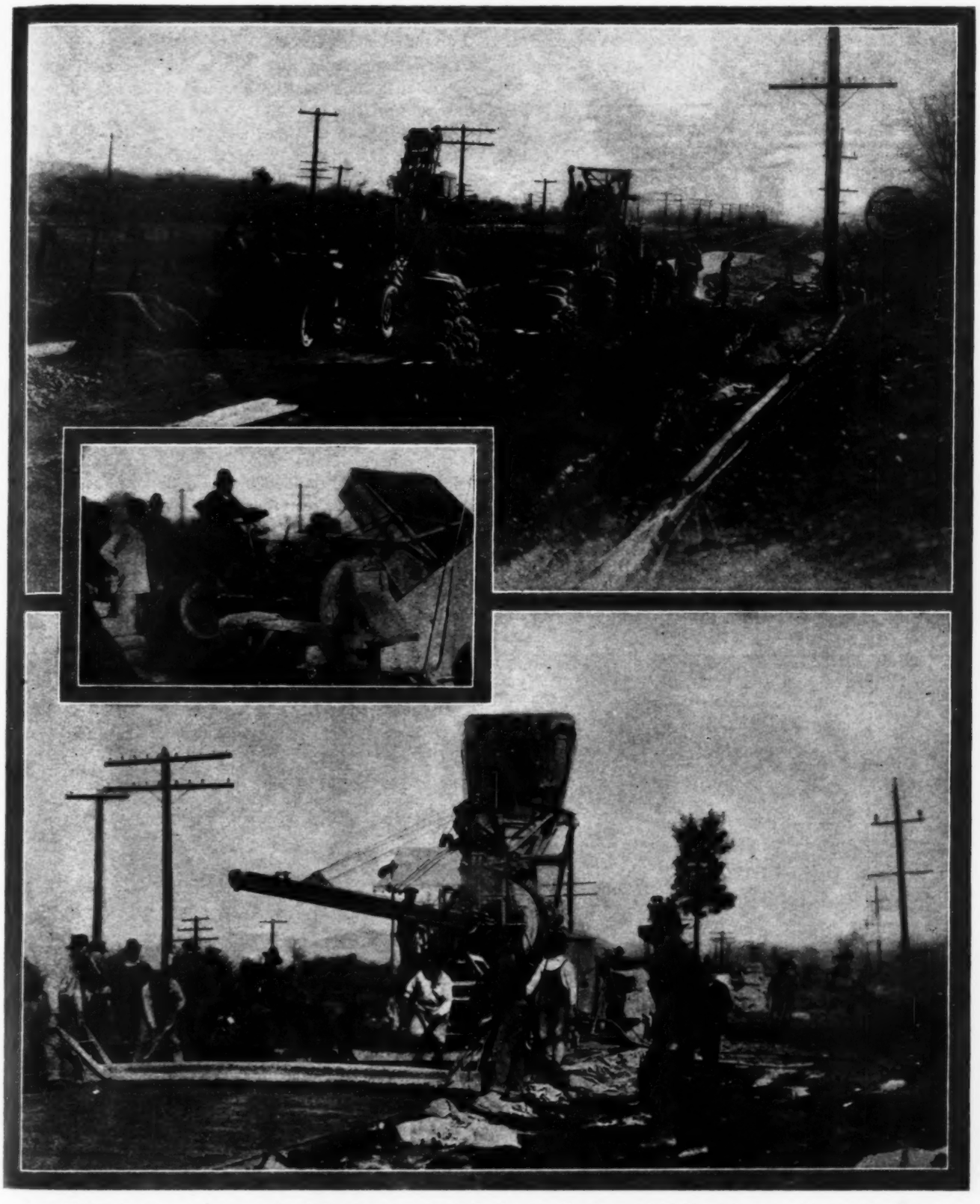
As commerce warrants, the development of the bay will be continued to keep up with the needs of New York Harbor. When the final development is reached, Jamaica Bay will have a channel 1000 ft. wide and 30 ft. deep around the bay, with dockage facilities larger than that of London, Liverpool, Rotterdam, Hamburg, Antwerp and Bremen combined. It is a stupendous piece of work.

The various features of the development dovetail one into the other in a natural manner under conditions almost ideal. For instance, as has been mentioned before, the Flushing-Jamaica Bay Canal will make a waterside terminal for the New York State Barge Canal. The Coney Island Ship Canal will allow small craft to make trips from the present New York Harbor to Jamaica Bay without going into the rougher waters of the lower bay.

The work, both design and construction, is being handled by the Department of Docks, City of New York. Work was started under the former Commissioner of Docks, Murray Hulbert, and is being carried on by the present Commissioner of Docks, John H. Delaney, and Henry A. Meyer, Deputy Dock Commissioner. T. F. Keller is chief engineer.



The Winner of Third Prize



The Kaiser Paving Company of Oakland, Cal., won third place in the Successful Methods concrete road building contest. These photographs show the prize-winning crew at work.

SHORT HAUL METHOD FAVORED ON ROAD JOB

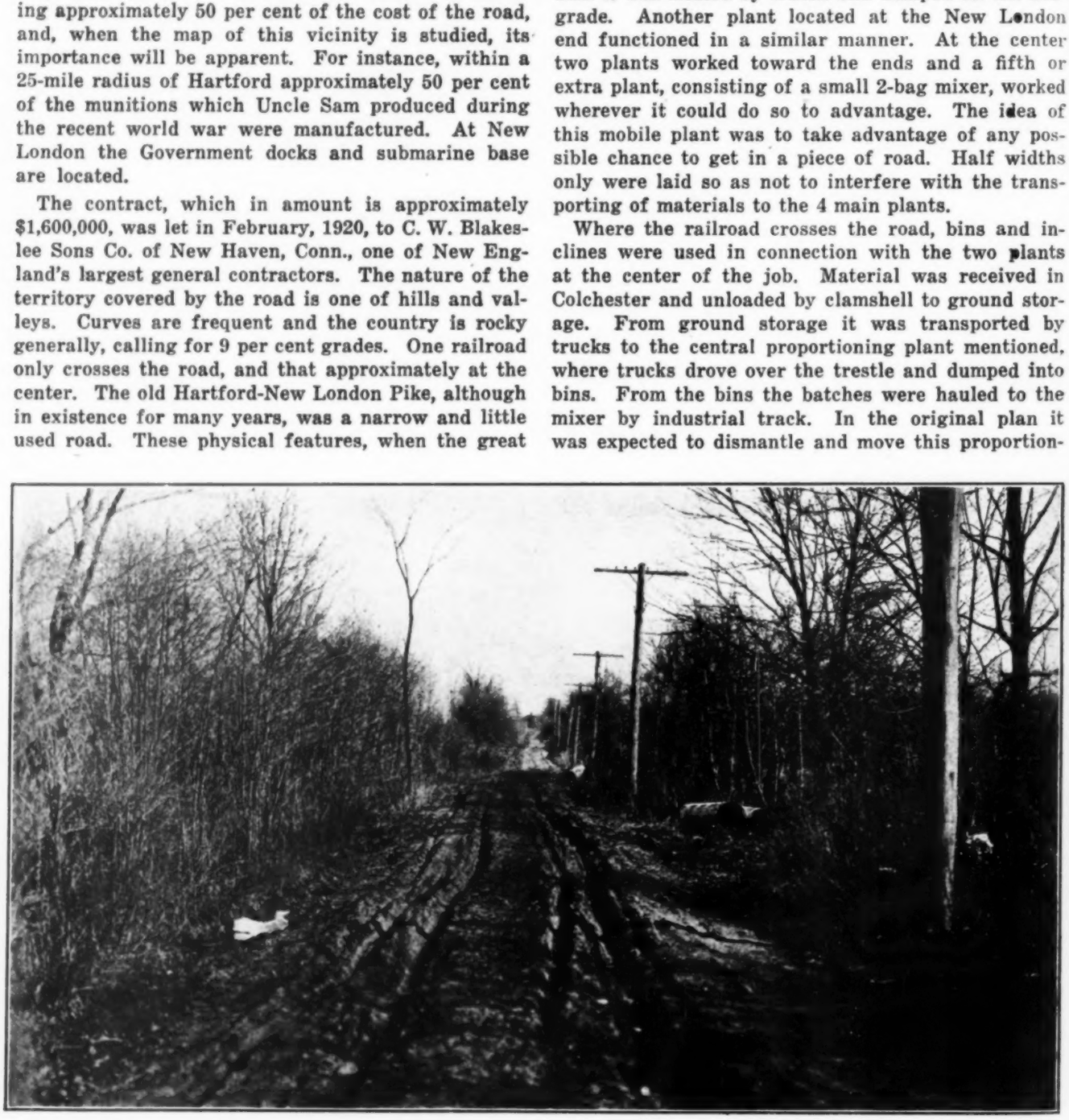
Various Plans Tried Out in Building New England's Longest Concrete Highway

NEW ENGLAND'S longest concrete road—in fact, the longest piece of concrete road let as a single contract east of the Mississippi River—is that known as Federal Aid No. 4, or the Hartford-New London Pike, a stretch of about 34 miles. This road is of great importance, as it will not only save a distance of about 20 miles from Hartford to New London and will dovetail with the road systems of Rhode Island and Connecticut, but it also is of tremendous military importance. The Federal Government is assuming approximately 50 per cent of the cost of the road, and, when the map of this vicinity is studied, its importance will be apparent. For instance, within a 25-mile radius of Hartford approximately 50 per cent of the munitions which Uncle Sam produced during the recent world war were manufactured. At New London the Government docks and submarine base are located.

The contract, which in amount is approximately $1,600,000, was let in February, 1920, to C. W. Blakeslee Sons Co. of New Haven, Conn., one of New England's largest general contractors. The nature of the territory covered by the road is one of hills and valleys. Curves are frequent and the country is rocky generally, calling for 9 per cent grades. One railroad only crosses the road, and that approximately at the center. The old Hartford-New London Pike, although in existence for many years, was a narrow and little used road. These physical features, when the great amount of mileage is considered, caused the contractors to study the matter of plant and method from all possible angles.

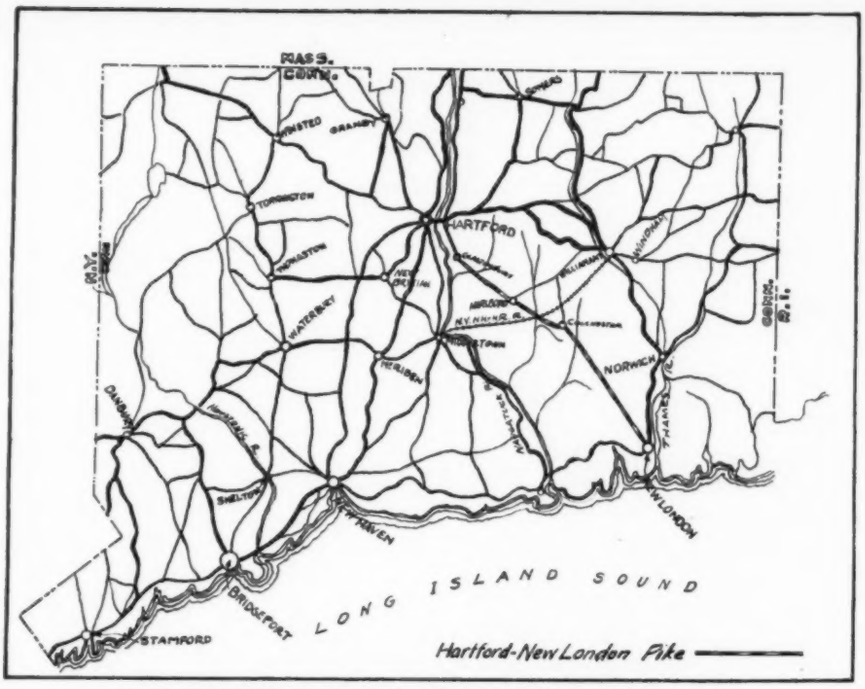
The work was divided into what might be termed 5 divisions, each having its own concrete plant. At Glastonbury, the terminal on the Hartford end, 5-ton trucks hauled sand from local pits and dumped on the subgrade. Trap rock was received by rail, shunted over trolley tracks and dumped into bins. From the bins it was hauled by trucks and dumped on the subgrade. Another plant located at the New London end functioned in a similar manner. At the center two plants worked toward the ends and a fifth or extra plant, consisting of a small 2-bag mixer, worked wherever it could do so to advantage. The idea of this mobile plant was to take advantage of any possible chance to get in a piece of road. Half widths only were laid so as not to interfere with the transporting of materials to the 4 main plants.

Where the railroad crosses the road, bins and inclines were used in connection with the two plants at the center of the job. Material was received in Colchester and unloaded by clamshell to ground storage. From ground storage it was transported by trucks to the central proportioning plant mentioned, where trucks drove over the trestle and dumped into bins. From the bins the batches were hauled to the mixer by industrial track. In the original plan it was expected to dismantle and move this proportion-



A SECTION OF THE OLD HARTFORD-NEW LONDON PIKE AS IT APPEARED BEFORE IMPROVEMENT WAS BEGUN.

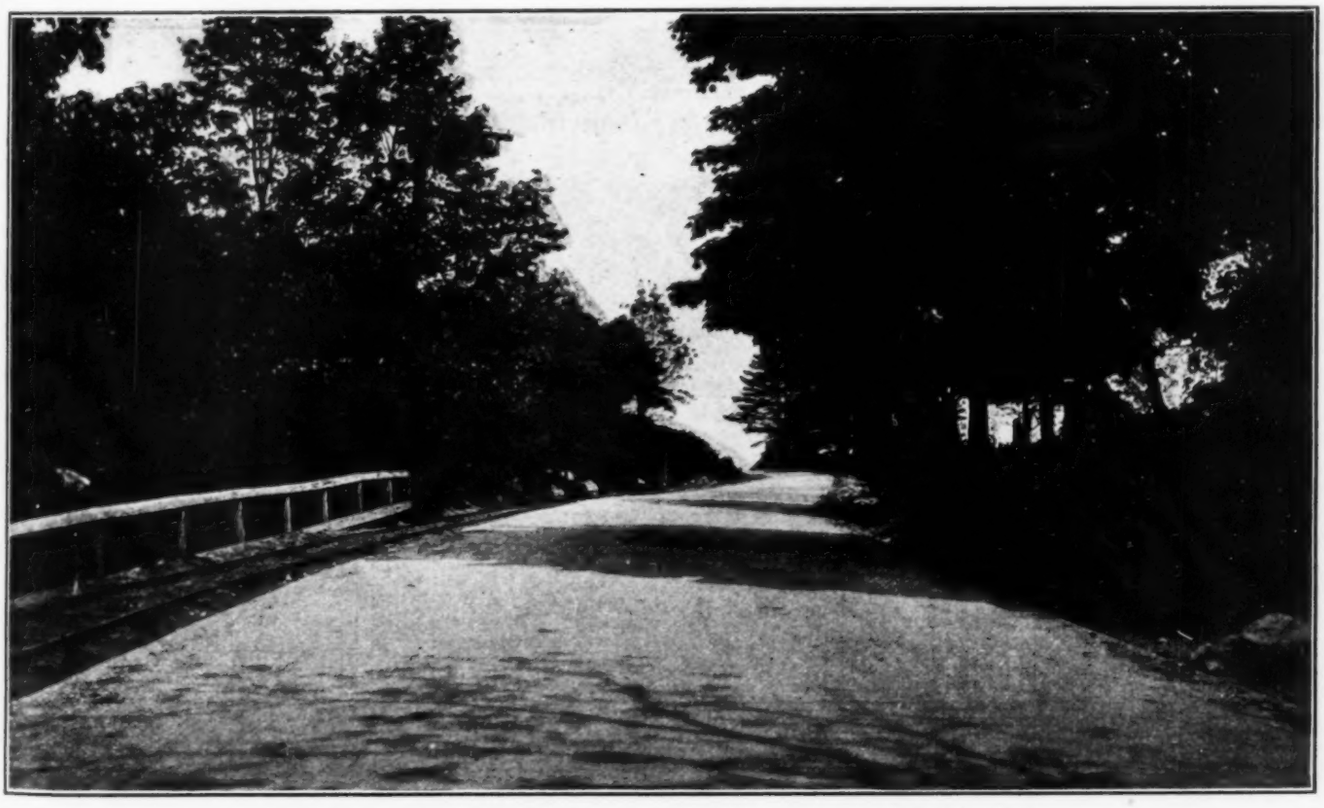
ing plant ahead as progress warranted. However, after one dismantling it was decided to do away with it entirely, and what is known as the short-haul method was adopted. By this method stone and sand were hauled from Colchester in motor trucks over the cured concrete as far as possible. At that point the trucks dumped on the concrete road. Material was shoveled from the concrete road into batch boxes on the industrial track by hand or by a mechanical loader.



MAP SHOWING MILITARY IMPORTANCE OF NEW ROAD

After a comparison of the work done by the five plants, the contractors inclined to the belief that the short-haul method is the solution of the concreting problem. They believe that trucks can haul over the cured concrete to a greater advantage than by using industrial track for the entire distance from stock piles to mixer. Beyond the end of the finished concrete, however, the cost of the upkeep on the subgrade and the delays due to wet weather showed a great advantage in favor of the industrial railway. Hence a combination of the two methods was adopted. In other words, the bringing of the material to within a 14-day curing limit by trucks saves an extra investment in switches, trains, locomotives and track, but still utilizes the industrial track method for the remainder of the distance. With the exception of a stretch of about 2 miles, the entire concreting was finished during the season just ended, which is a record of 33 miles in 2 years.

The personnel of the job consists of William Ryan, general superintendent, and an assistant superintendent in charge of each of the five plants. The road is 18 ft. wide with the dimensions of 6-8¼-6. The work is under the direction of the State Highway Department, Charles J. Bennett, commissioner, and R. L. Saunders, chief engineer.

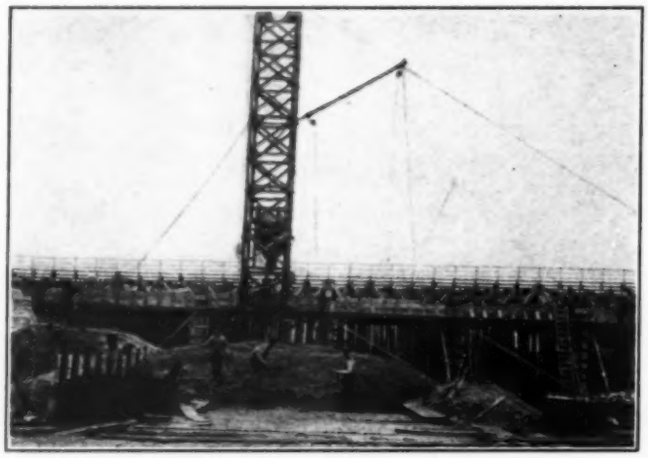


A STRETCH OF HARTFORD-NEW LONDON PIKE AS IT LOOKS TODAY

ELIMINATING THE "CONSTRUCTION SEASON"

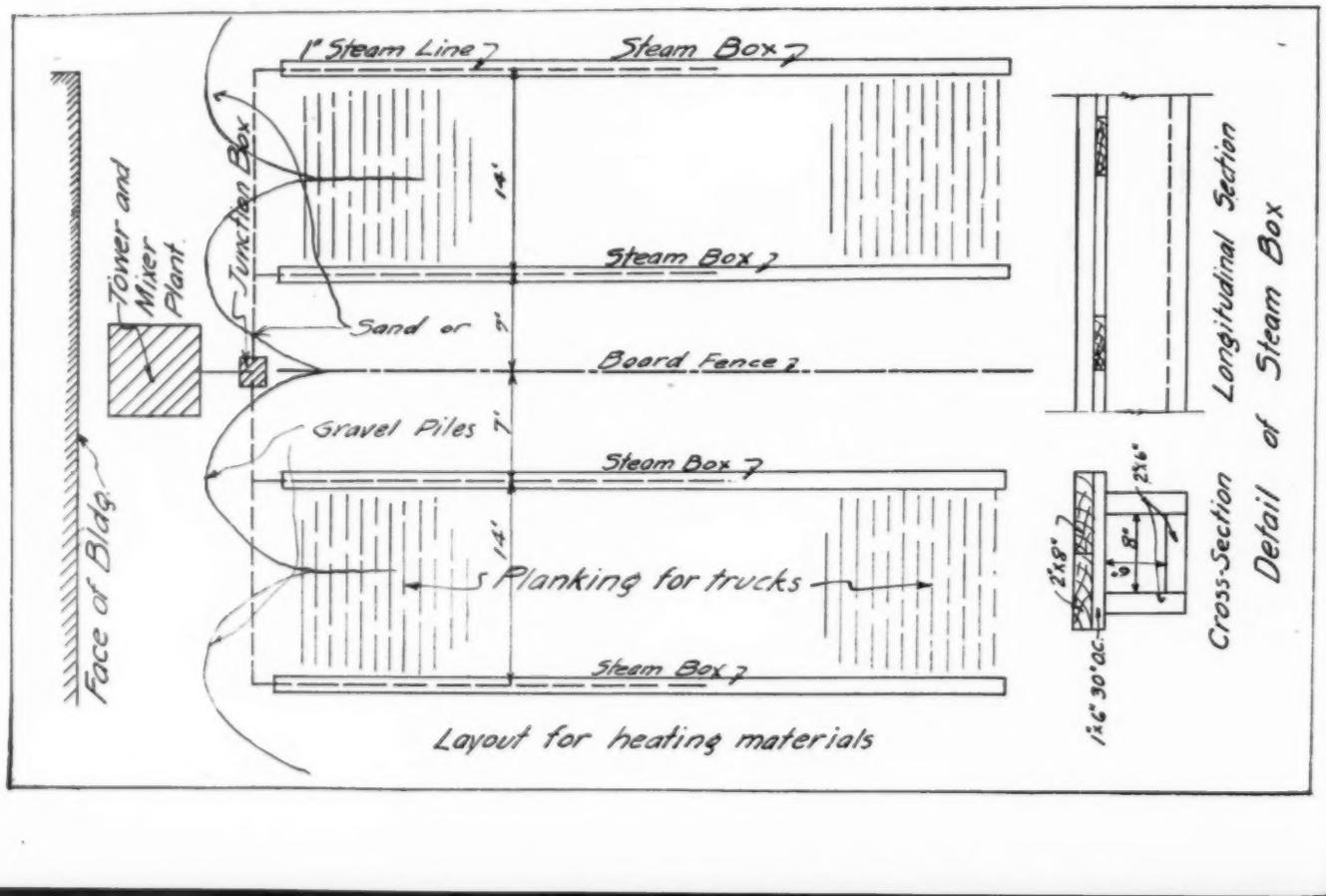
Pennsylvania Contractor Has Well Arranged Plant for Heating Materials During the Winter Months

STEAM boxes—sturdy plank boxes without holes to clog up or to allow the boxes to become filled, and so arranged that the material piles are accessible to the mixing plant as well as to the trucks delivering the material—are an important part of the plant which William Steele & Sons Co. are using on their 3-story flat slab factory job which is now under construction at Kensington Avenue and M Street, Philadelphia. A sketch showing the layout and detail of the steam boxes is given. Four 1-in. steam lines, connected to a junction box near the mixer plant, enter each of the lines of steam boxes and project into them approximately half way. As may be seen in the detail, the covers of the boxes are made up of 2-by-8's which project slightly over the box proper. A 1-by-6 crosspiece on about 30-in. centers forms an opening through which the steam escapes to the material piles. The projection or overhang prevents the material from getting into the boxes and at the same time there is no chance of clogging which is a great advantage over the box in which holes are bored. From the construction it is seen that it is sufficiently strong and that there is no chance of a collapse. Another advantage of this particular layout is that the piles are arranged in parallel so that, should one box be stripped the other would be available.

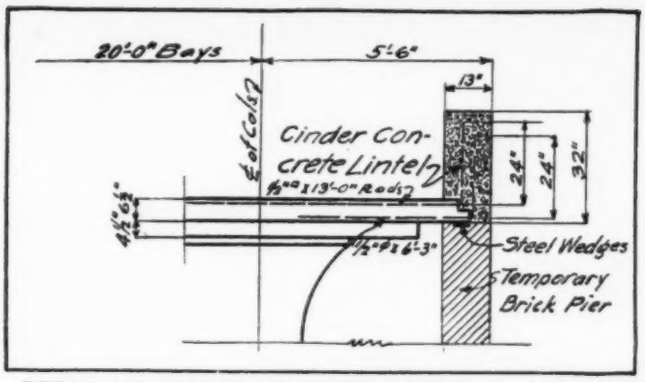


HALF OF MATERIAL PILE WITH STEAM BOXES PROJECTING

A feature of the design of this building, which is worthy of attention is the manner in which William Steele & Sons, who are the designers as well as the contractors on the job, have taken care of the future extension of one side of the building. To prevent the reinforcing steel from projecting and thus being exposed to the elements until the future connection is made a cinder concrete lintel, a detail of which is shown in the illustration, is provided, into which the rods are bent upward. The brick piers are temporary also, and when the future connection is made these piers, as well as the cinder lintel, come out. The temporary



wall and lintel are placed at a distance of 5 ft. 6 in. from the center line of columns, this being the point of inflection or zero moment. When the lintel is knocked out, the rods are bent back into normal position in place for the future floor slab, and the normal bay length of 20 ft. resumed. The cinder concrete lintel serves two purposes: It prevents the rods from rusting and has sufficient depth to cover the steel which depth gives it the proper strength. During the period in which the wall is temporary, steel wedges resting on top of the brick piers are wedged so as to force the piers to carry part of the floor load.



DETAIL OF CINDER CONCRETE LINTEL TO CARE FOR FUTURE CONNECTION

The job is to be carried on regardless of weather conditions by means of tarpaulins and salamanders, and the materials are to be heated as before described. The total cost, including heating plant, electrical equipment, sprinkler and plumbing, is about $225,000. William Steele & Sons, Philadelphia, are engineers as well as contractors; J. E. Allen is engineer in charge, and Morton Schilbred is superintendent on the job.

HIGHWAY WORK LOSES ONE OF ITS LEADERS

Lewis S. Sadler, State Highway Commissioner of Pennsylvania, Dies Suddenly

IN the death of Lewis S. Sadler, State Highway Commissioner of Pennsylvania, which occurred on Jan. 20 at his home in Carlisle, Pa., the great nation-wide work of highway construction lost one of its ablest leaders. Everyone who is familiar with the highway situation in the United States knows that Pennsylvania under Mr. Sadler's direction has taken its place in the front rank of the commonwealths which are setting the pace in road building. Last year Pennsylvania led all of the states in the construction of concrete roads, 670 miles of concrete highways having been constructed. In 1920 a little more than 400 miles were built and adding to that the 200 miles built in 1919 gives a total of nearly 1400 miles of concrete highways built in the three years since Mr. Sadler took charge of the work.

Mr. Sadler, who was 48 years old, went into office as State Highway Commissioner at the request of Governor Wm. C. Sproul on Jan. 21, 1919. At the preceding November election the people of the State had authorized a bond issue of $50,000,000 for road building and the proper expenditure of this sum was the first and most important problem that confronted Mr. Sadler. Up to that time road building in Pennsylvania had been done in a rather haphazard manner and no genuine attempt had been made to work out a connected system of highways. Despite considerable opposition from various parts of the State, Mr. Sadler began the work by planning a system of primary highways that would benefit the State at large rather than particular communities. In planning this primary highway system no attention was paid to county lines, a proceeding which at once brought to Harrisburg a host of protesting delegates who wanted roads built in their own counties without much regard to the welfare of the rest of the State. A good indication of Mr. Sadler's character is the fact that for two months he was so busy meeting such delegates and carefully and patiently explaining the situation to them that he did not even have time for lunch. In practically every case he succeeded in convincing the visitors that the general welfare of the State as a whole was more important than satisfying the desires of their own communities.

With the primary plan out of the way and the actual building of concrete highways begun, Mr. Sadler found time during the 1919-1920 construction seasons to make personal inspection of the various projects. Leaving Harrisburg on Thursday morning in company with Col. W. D. Uhler, Chief Engineer, he usually remained on the road until late Sunday. One matter in which he took particular interest was the provision made for the men by the different contractors. He usually saw to it that the men working on the roads of Pennsylvania were satisfied with their jobs and were well treated by their employers.

"No short-time roads with long-time bonds" was a sort of slogan with Mr. Sadler, and as part of this principle he organized the Maintenance Division of the Pennsylvania Highway Department, in such a way that Pennsylvania might well be called a leader in that sort of work. As soon as a new state highway is built in Pennsylvania the Maintenance Division takes it in charge and keeps it in shape for the handling of the traffic for which it was built.

One of Mr. Sadler's pet antipathies was the overloaded truck and he never relaxed his efforts to drive such trucks from the highways of Pennsylvania.

During his three years as highway commissioner Mr. Sadler never turned in an expense account. He drove to Harrisburg in his own machine and while on the road paid his expenses out of his own pocket. When the last Legislature gave him the power to fix the salaries in his department he gave the Assistant Highway Commissioner, George H. Biles, a greater salary than he himself was receiving.

AN UNUSUAL CENTRAL MIXING PLANT

Conveyors Used to Keep Hoppers Filled On Iowa Road Job

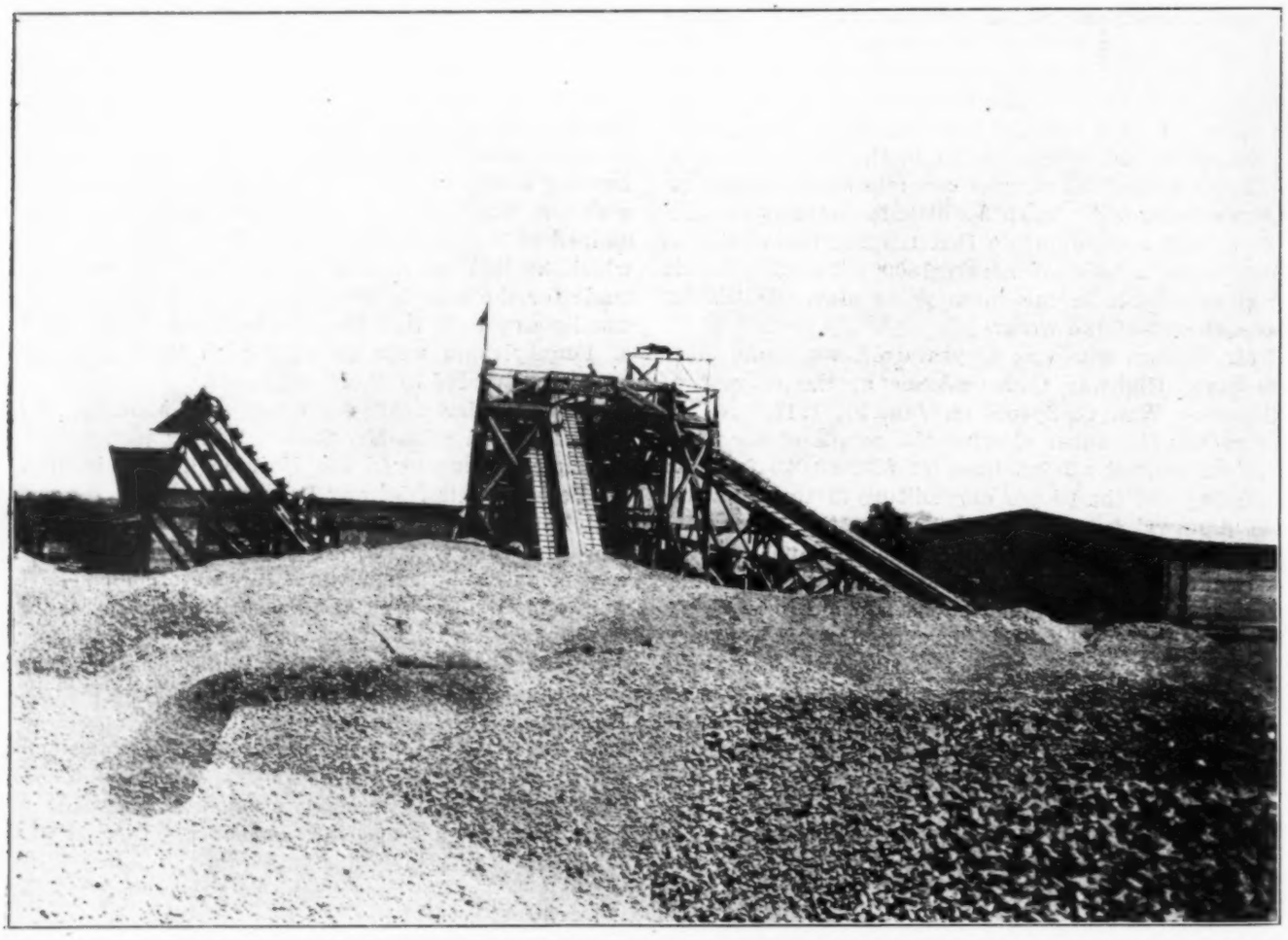
USING a central mixing plant has been found in certain cases to be a satisfactory method of building concrete roads. An unusual plant of this kind which has made good is used by the Henry W. Horst Company, general contractors of Rock Island, Ill., on their job at Cedar Rapids, Iowa, called the Mt. Vernon Road. Two smooth belt conveyors, each 75 ft. long, were used to convey the sand and gravel from hoppers on the ground to the storage bins above. Each of the ground hoppers has a capacity of 6 cu. yd. and is charged directly by 3-yd. trucks hauling from the railway unloading point in Cedar Rapids, a distance of about 4 miles. Cement was carried up to the charging platform above the mixer on a small car on narrow-gage track pulled by cable and gasoline engines.

Storage piles of sand and crushed rock were kept at the plant to regulate unfavorable hauling conditions from the unloading base at Cedar Rapids. This material was reclaimed from storage piles by the use of a bucket loader and trucks to conveyor hoppers. With this arrangement the mixing was entirely independent of the hauling and the material stock at hand insured a continuous operation. A 4-bag concrete mixer and a mechanical tamping and finishing machine laid the concrete. A turntable was used between the forms for reversing the trucks.

The dimensions of the road are 18 ft. with cross sections 7-8-7. The mix is 1-2-3½, with bar reinforcements. The 4-bag mixer used averaged 400 ft. per 10-hr. day, with a maximum of 700 ft. in 10½ hr.

The mixing crew consisted of 13 men, as follows: 1 mixer engineer, 2 cement men, 1 cement hoist, 2 cement shed, 1 conveyor engineer, 2 conveyor hopper tenders, 1 conveyor helper, 1 wagon loader engineer, 1 truck driver, 1 foreman. The hauling crew consisted of 23 men, as follows: 17 truck drivers, 1 oiler, 1 mechanic, 3 helpers, 1 boy. Placing and finishing crew consisted of 21 men, as follows: 4 men covering, 2 men sprinkling, 2 men at the turntable, 3 men in the wet concrete, 1 tamper engineer, 1 finisher edger, 2 light graders, 2 form setters, 1 water boy, 1 pumpman, 1 man with a team and 1 foreman.

The central mixing plant with the idea of the storage system as above described, has some noteworthy advantages. As in this case it permits the hauling of materials to be started before actual construction is begun so that considerable material may be stocked in advance. On this job 3000 bbl. of cement were stored in a shed.



THE STORAGE PILES IN THE FOREGROUND KEEP THIS CENTRAL MIXING PLANT SUPPLIED AND ELIMINATE DELAYS DUE TO UNFAVORABLE HAULING CONDITIONS.

Portable Concrete Plant Used on Railway Elevation

THE above illustration shows the portable concrete plant which the H. F. Curtis Company of New York City are using on the third section of the Lackawanna track elevation at East Orange, N. J. Mounted on a flat car is a 1-yd. mixer; sand and stone bins holding about 12 yd. each; cement storage and a 40-ft. wooden tower with steel chutes. The contractors are using this outfit to pour both the retaining walls and the columns and deck of the viaduct. The bins are served by a locomotive crane equipped with a clamshell bucket.

A portion of the new walls which are of the gravity type may be seen in the background. The flat slab viaduct is 1080 ft. long and has a maximum width of 77 ft. The deck slab is 18 in. thick and is supported on 214 circular reinforced concrete columns. One-inch twisted rods form the main reinforcing in the deck.

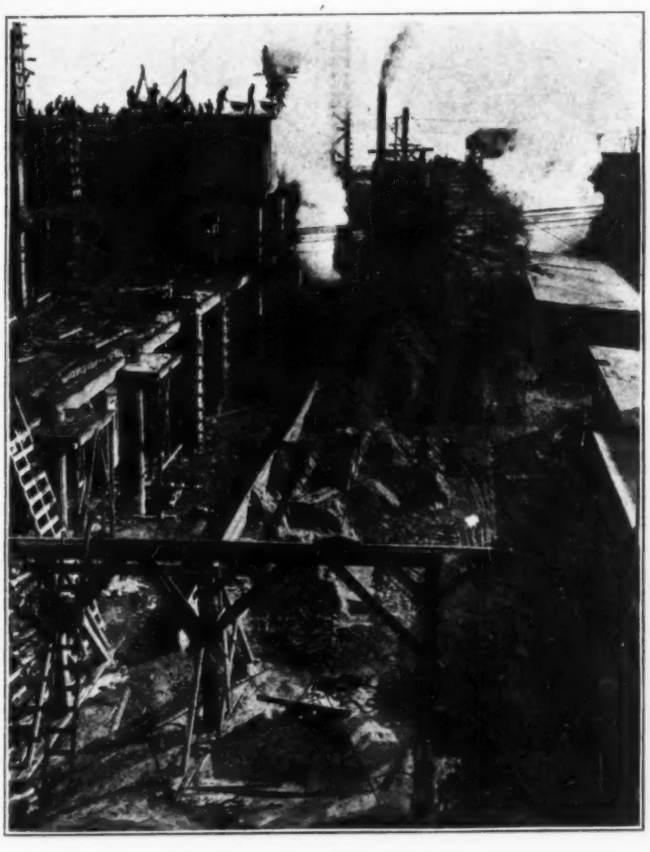
To concrete the viaduct, the movable plant is spotted at one end after sand and gravel have been stockpiled alongside. A cement car follows and after that comes the locomotive crane with clamshell bucket. The concrete is elevated in the tower and shot into a hopper which charges small dump cars which run over industrial track. The section of work being done by the Curtis company was started last April and will be finished the coming season.

Other contractors having general contracts are the F. M. Talbot Company of New York City, and Hyde, McFarlane & Burke of Madison, N. J. The work is being done under the direction of G. J. Ray, chief engineer of the Lackawanna Railroad. O. H. Kellogg is resident engineer in charge.

Slack Cable Excavator Loads Bin

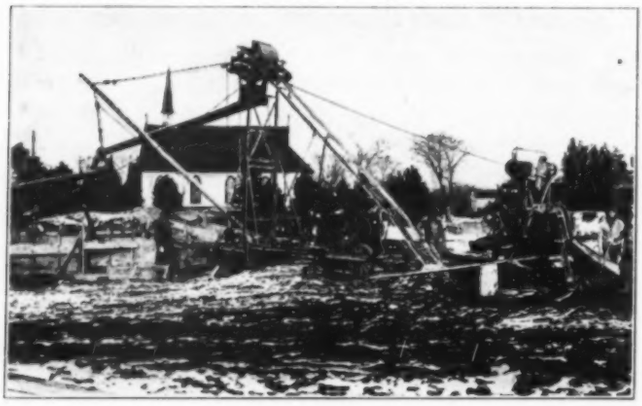
A SLACK cable excavator was successfully used to load a material bin over the mixer, as shown in the illustration. By this arrangement the contractor was able to take advantage of the long storage pile and at the same time to keep the bin filled as needed. The cable is slacked and the bucket dragged through the material fill. The bucket is then pulled over the bin and automatically tripped by a dumping block fastened to the cable. With a sheave, a gallows-frame with a movable block, as shown in the foreground of the picture, the bucket is allowed to work over the entire width of the pile. Over the material bin is constructed a plank incline with flare sides on to which the bucket dumps. This incline serves to guide the material into the bin so that no time is lost in spotting the excavator bucket over the bin. For a long and narrow storage space accessible to trucks, this method of charging material bins appears to have considerable merit.

Inasmuch as this job, which is the construction of a 5-story flat slab factory building, carried the contractor into cold weather, preparations for concreting under freezing conditions were made. The entire concrete plant is tightly inclosed.



Placing Concrete Without Wheeling

STANLEY CARMAN, mason contractor of Woodmere, Long Island, does a considerable amount of foundation work for dwellings. For pouring the foundations he has rigged up a mobile plant, which is shown in the illustrations. An inclined track is mounted on a set of trucks, and the bucket filled with concrete is hoisted up this track, from the top of



which it discharges into steel chutes. A gasoline builder's hoist furnishes the power. A hole is dug in the ground at the base of the incline to allow the mixer to discharge into it.

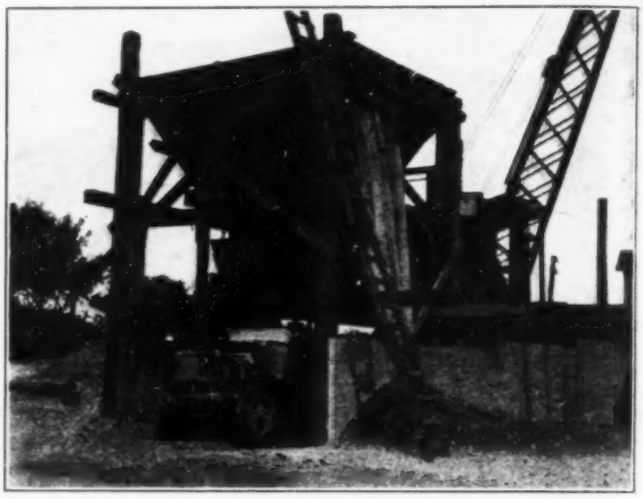
The lower picture shows the mixer mounted on a motor truck. To use this rig a hole is dug in the ground to allow the skip to be flush with the surface. With this latter outfit the contractor pours sidewalks, walls, etc., with ease, whereas for more complicated work a combination of the two outfits, as shown above, is used.

Old Wagon Body Does Duty on Road Job As Proportioning Hopper

AN old-style, bottom-dump wagon was converted into a proportioning hopper and used with great success in connection with a central proportioning plant by the Good Roads Engineering & Contracting Company on a 12-mile concrete road job near Bridgehampton, L. I. The proportioning plant consisted of a two-compartment bin, one compartment for sand and one for gravel, each having three gates. Directly underneath was placed an old-style, bottom-dump wagon. This wagon was divided down the center and had three compartments on each side. The trucks which carried the batches to the mixer were spotted directly underneath. The trucks also were divided into three compartments, each carrying a 4-bag batch for a 1-1½-3 mix. The proportioning of each batch was done in the old wagon body and the trucks were charged in a few seconds.

The wagon body which was built up with the sideboards was dumped by a man tripping the ratchet, the same as on a common dump wagon, except that a shaft extended out to one side to make the tripping more convenient for the man who operates the gates.

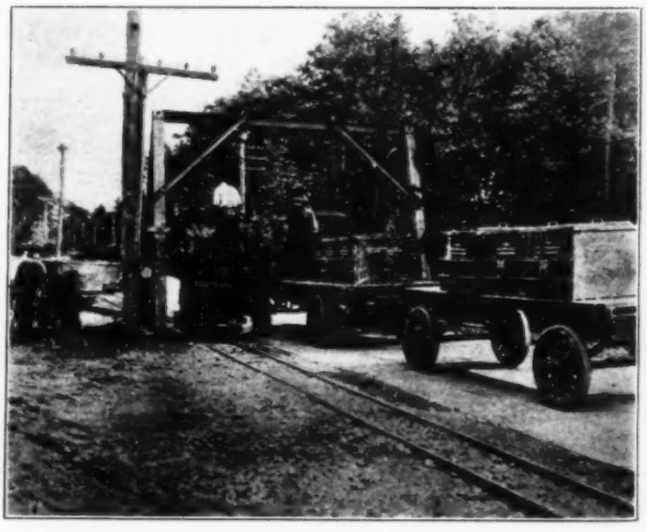
The contractors obtained sand and gravel from their own pits at Montauk, L. I. The portable wagon loader



used to load cars loaded sand at the rate of 1 yd. per minute. Much favorable comment has been made on the operation of this proportioning plant, which was devised by Oscar Anderson, superintendent of the Good Roads Engineering & Contracting Company.

Gallows Frame Used to Transfer Batch Boxes

THE Royer-Ferguson Company on its concrete road job at Accomac, Va., used the combined light railway and motor truck system and the method used to transfer the batch boxes from the trucks to the industrial cars is shown in the illustration.



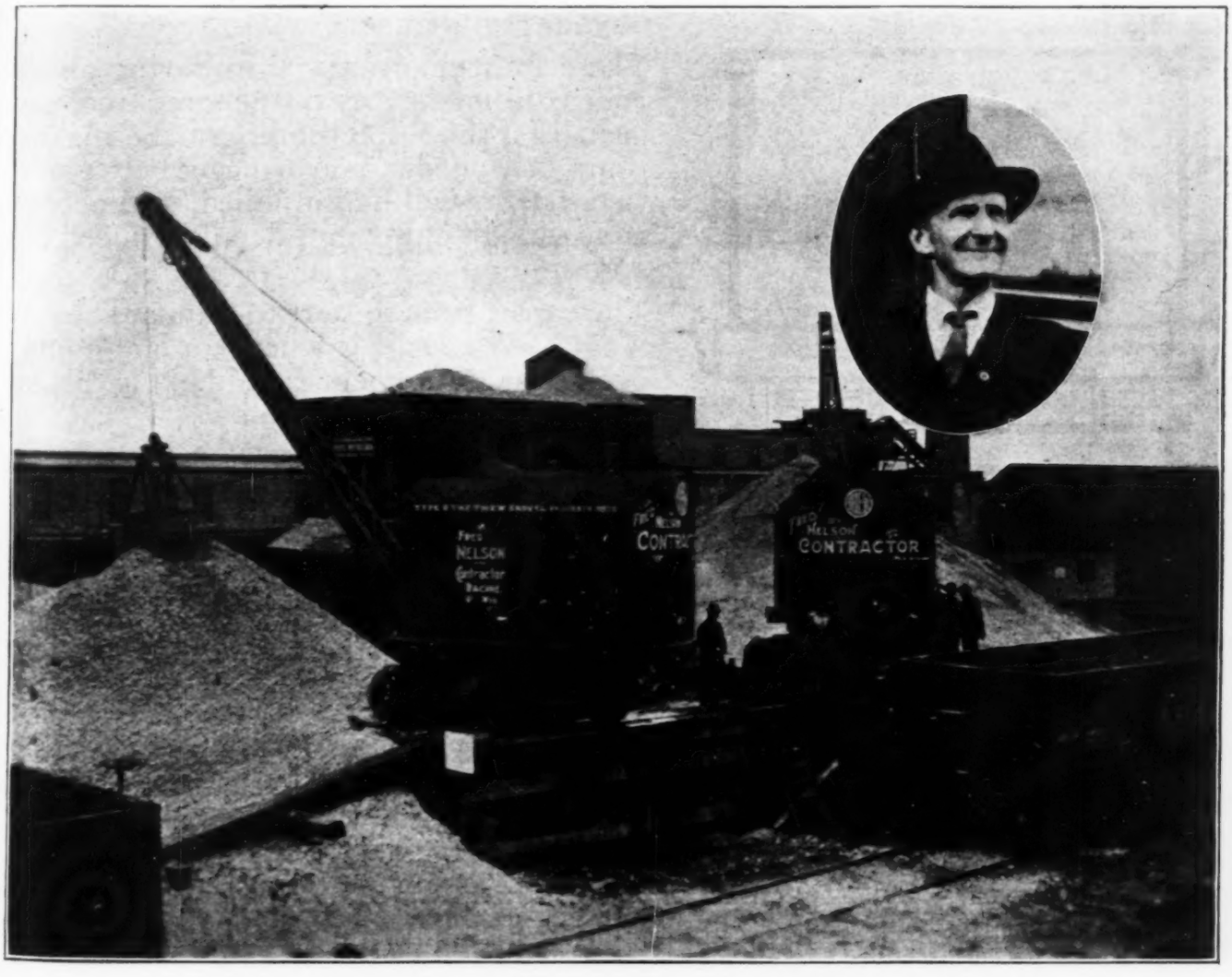
Turntable for Highway Work

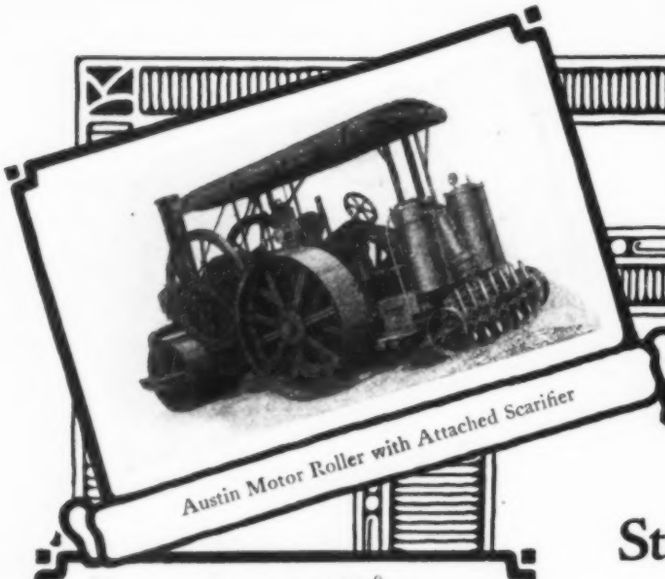
A HOME-MADE turntable which travels on steel forms and is pushed along by a mixer, is shown in the photographs. The plank ramp, which is used in connection with the turntable is dragged along

either by hand or by trucks. The turntable is of steel and was designed and is being used by the Stabell Construction Company on a concrete highway job in New York State.

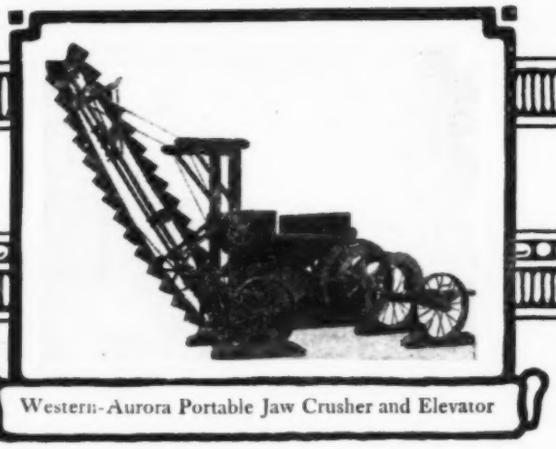
Cranes Keep Bin Full and Speed Up Job

THE material yard shown in the photograph below is owned by Fred Nelson at Belvedere, Ill. This yard was used on a 4½-mile concrete road job. As the photograph shows the work of unloading was handled by two steam shovels equipped with crane boom mechanism and clam-shell buckets. At times when the work was going on at full speed both cranes were kept busy supplying the bins.

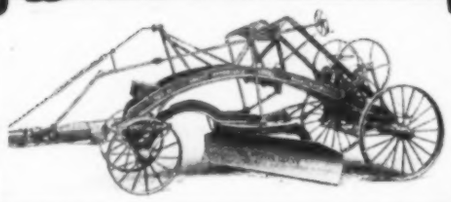




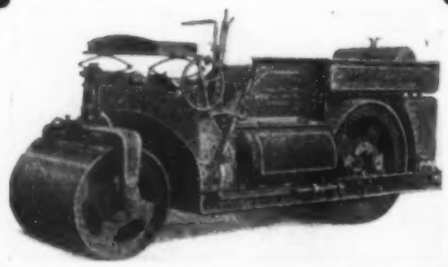
Austin Motor Roller with Attached Scarifier



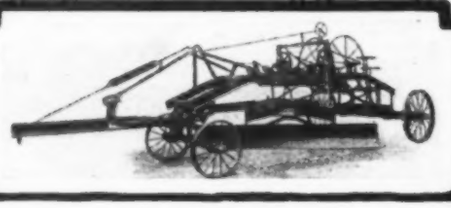
Western-Aurora Portable Jaw Crusher and Elevator



Austin Giant Grader



Austin Tandem Motor Roller



Western No. 20 Grader

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There are real advantages in having all of your equipment part of the same line, especially if the responsibility of the maker is unquestioned. You will get better service, repairs will be simplified, and necessary, though annoying, details reduced to a minimum.

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Elevating Graders	Dump Wagons	Road Planers	Ditchers
Road Scarifiers	Culverts	Road Scarifiers	Screening Plants

The Austin-Western Road Machinery Co.

CHICAGO, ILLINOIS

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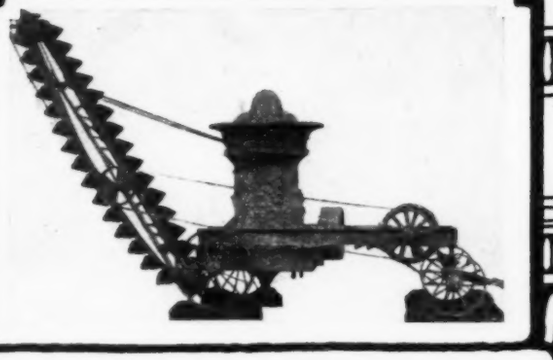

Austin Portable Gyratory Crusher and Elevator

Austin Steam Roller with Attached Scarifier

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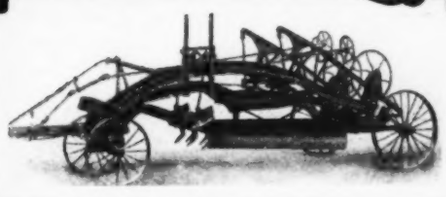
Dallas	Nashvillle	Richmond	Wahoo, Neb.
Denver	New Orleans		



Austin Rip-Snorter

Austin New Era Elevating Grader

Western Contractors' Dump Wagon

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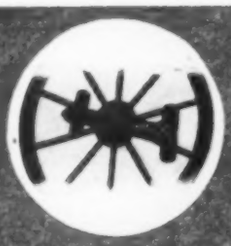
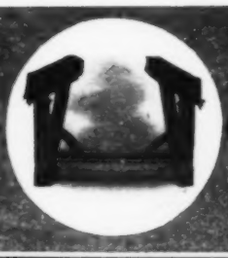


10 Spoke Wheel

Self Lubricating Bearings



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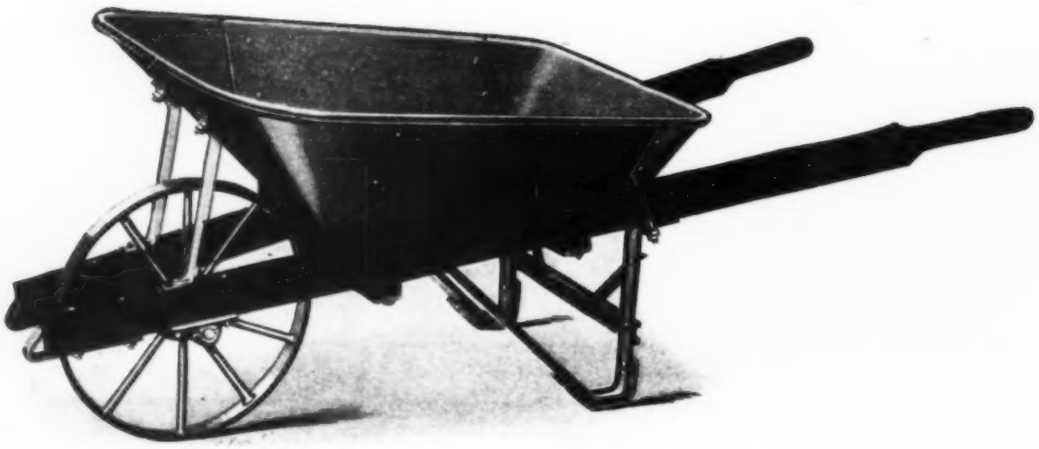

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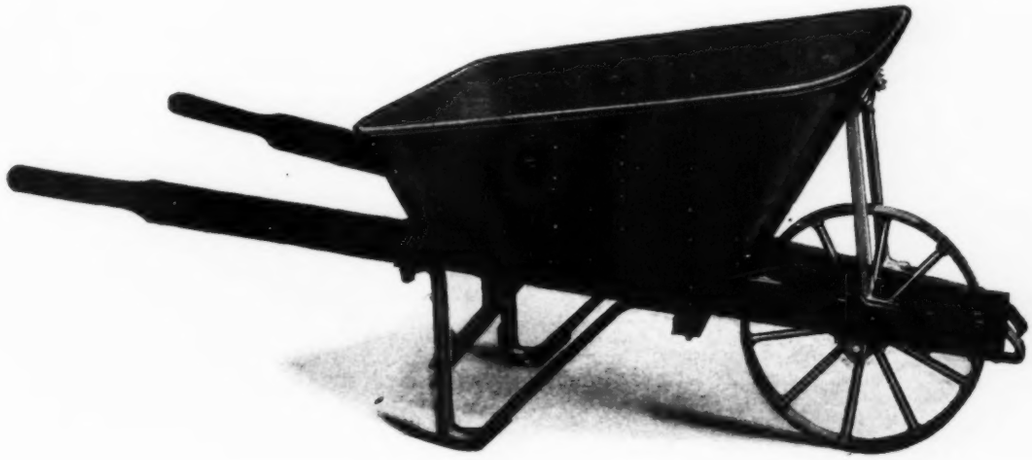

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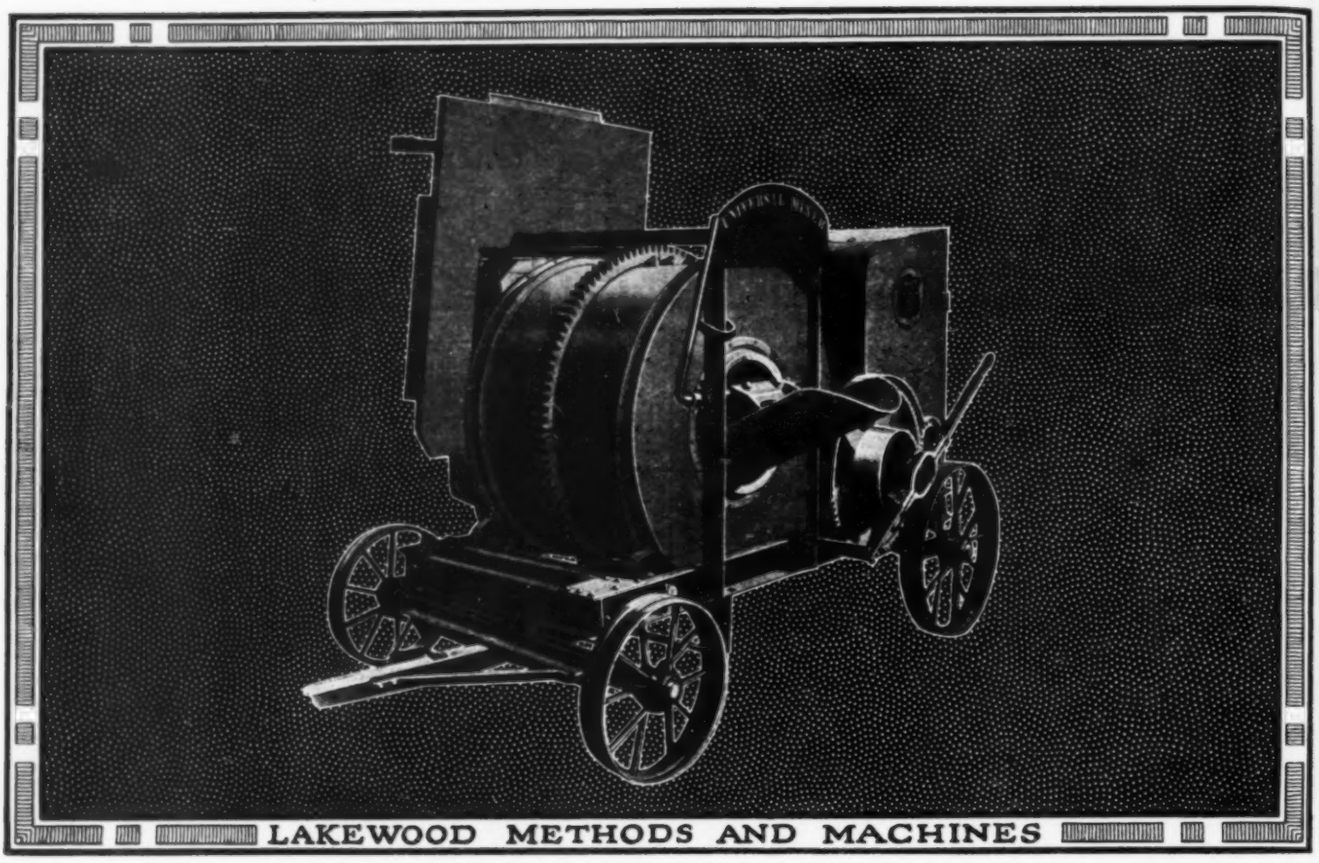

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With the 19-in. low platform it's easy to wheel a barrow up to the mixer. The 26-in. charging opening means no material spilled and wasted. And the lip of the charging opening is unusually close to the platform, making it easy to dump the barrow "clean."

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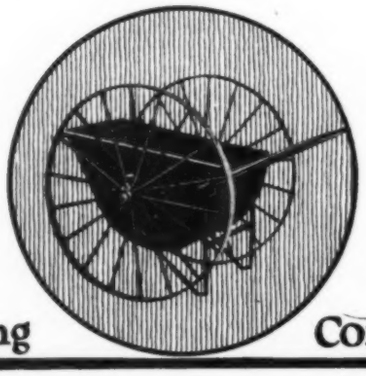
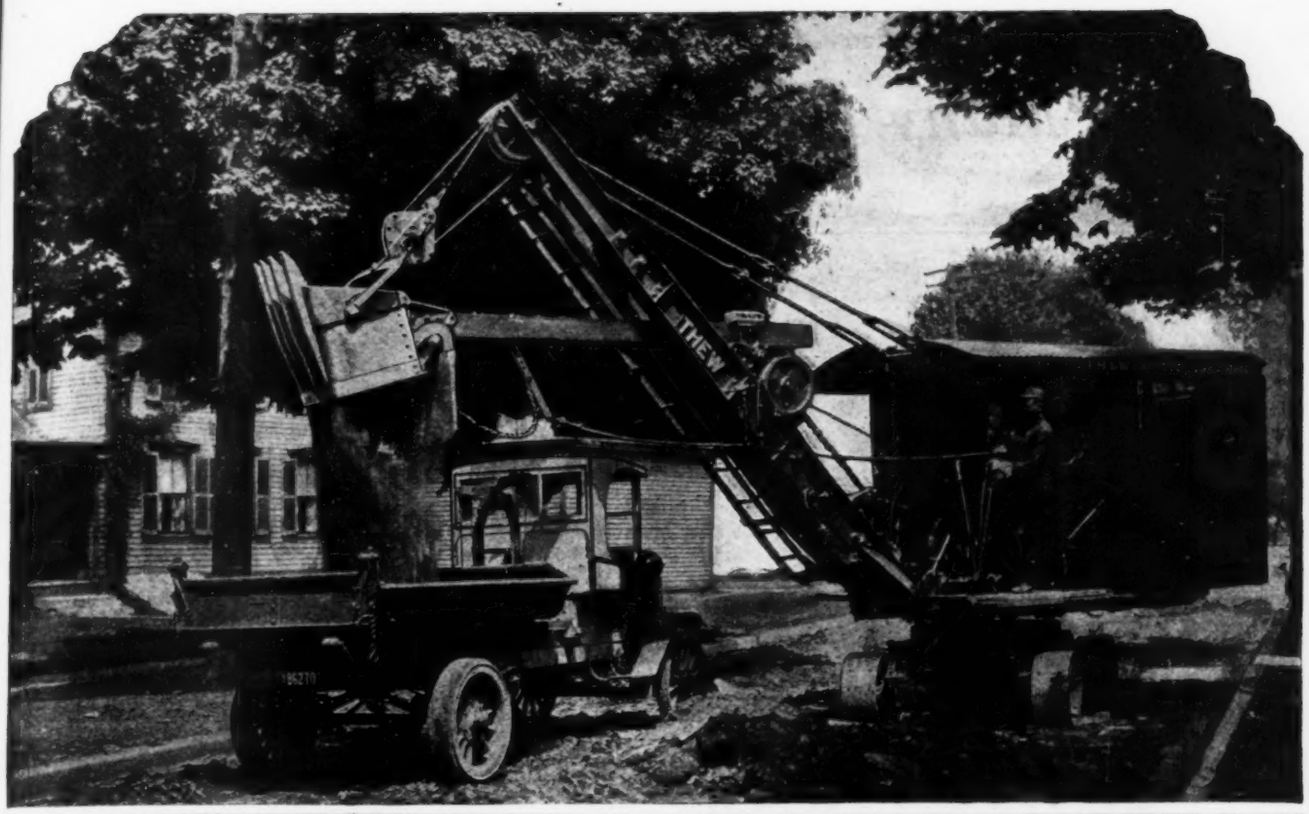


The Lakewood Engineering Company, Cleveland U.S.A.



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Same range, same flexibility as Thew steam shovels. In fact, except for adapting the gearing to a single source of power, they are identical in design and construction, having many units in common.

They have most of the features which have made Thew steam shovels the leaders and include new and exclusive features which add to their efficiency.

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The Superintendent was asked—

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Let's see--20 men at 35 cents an hour cost $70.00 a day.

Ten percent of the material is wasted by the wheelbarrow method. An Illinois contractor uses the same amount of material for an 18-ft. road, that he formerly needed for a 16-ft. road by the wheelbarrow method.

The time wasted is the worst feature -- figure it yourself. Industrial Railway Haulage, with batch-boxes, means a much longer season and no time lost because of weather conditions.

The Old Way vs. The New

The question is this: Is your contract adapted to industrial railway haulage? If so, and it probably is, WE CAN MAKE YOU MONEY AND WANT TO DO IT.

Let our experienced road engineers analyze your contract and advise as to methods and equipment. Advice costs nothing and you will get it straight.

If we help you make money now, you will help us make money some other time.

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Western Wheeled Scraper Company

Earth and Stone Handling Equipment

AURORA, ILLINOIS

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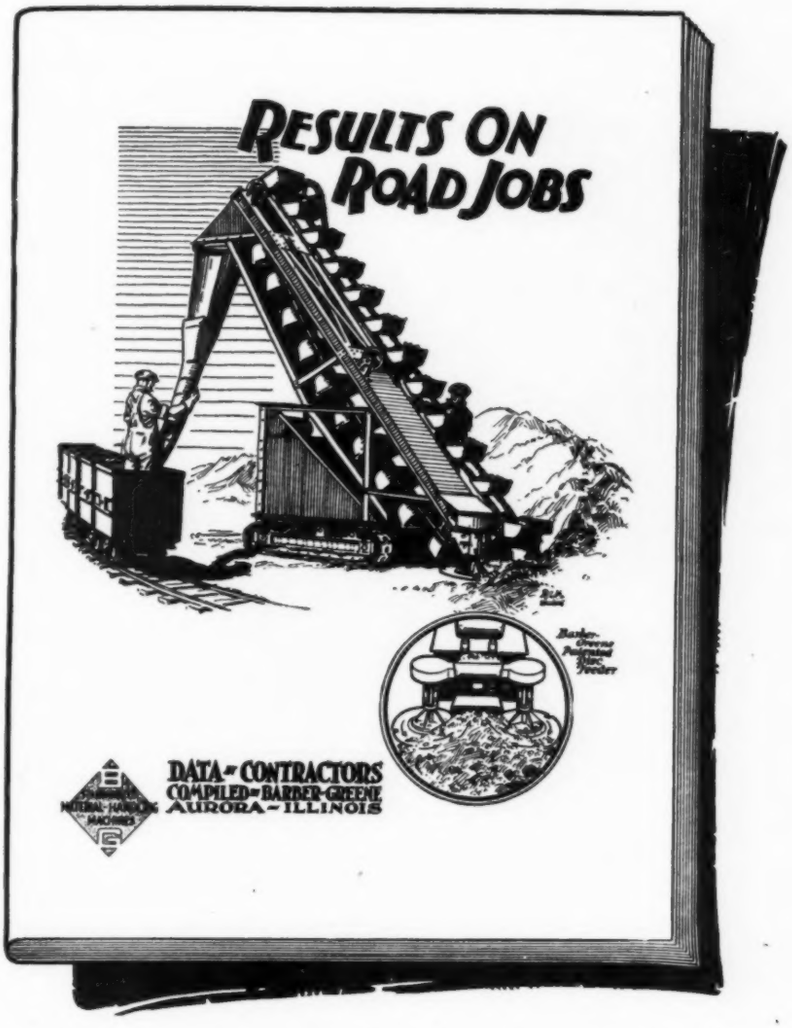

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Learn how many practical road contractors got results on road jobs in 1921 by using Barber-Greenes to load:

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In planning your method on the next contract you should have this book. Perhaps it shows how some contractor has overcome the conditions you will meet in your next contract. Get it now Mail the coupon today.

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Gentlemen:

Please send me a copy of your "Results on Actual Road Jobs." No obligation.

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Simplicity, strength and dependability are the outstanding features of the Clyde line of hoisting equipment.

In the building of Clyde hoists the first task comes in the selection of materials, all of which are rigidly tested under operating conditions. The next factor is workmanship. Highly skilled and specialized employees, many with years of training in our own plant, solve our construction problems.

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It is mounted on the end of the intermediate shaft and positively prevents backward rotation of the gearing in case of interrupted currents. It is quick acting, positive, strong and simple.

The Clyde engineers are at your service in solving your hoisting equipment problems.

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They look so much alike that the maker himself cannot distinguish the difference. It requires a laboratory test. And, yet there are six cents difference per foot in the base price and *four tons difference in tensile strength.*

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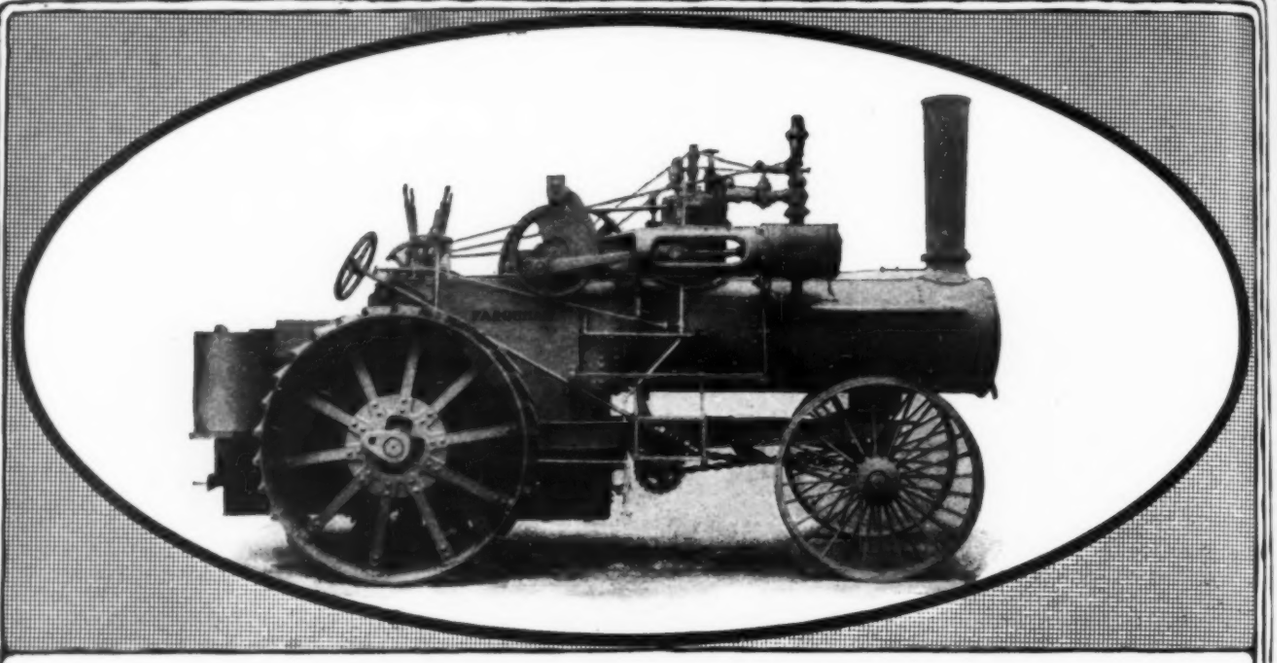

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These concerns handle the best in every line of tools and equipment and they have a full realization of the importance of service.

A Red Edge distributor means a complete warehouse stock carried at that point and an organization ready and anxious to serve your requirements promptly and intelligently.

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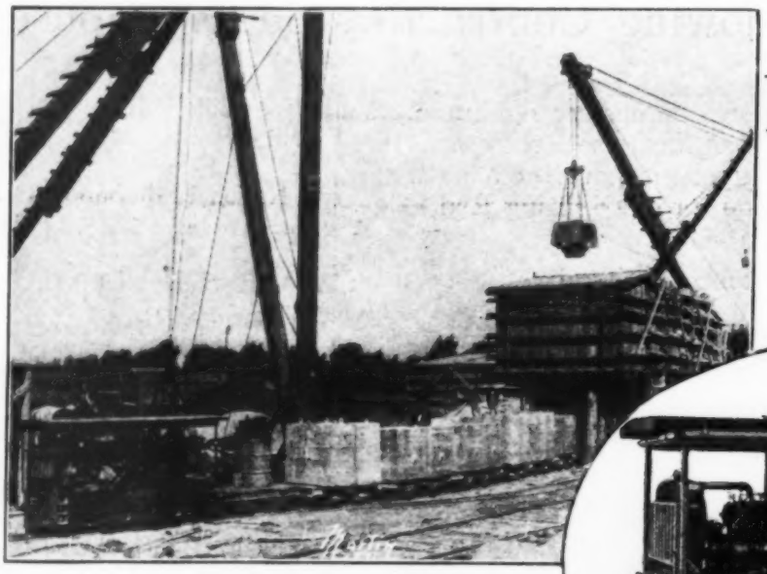
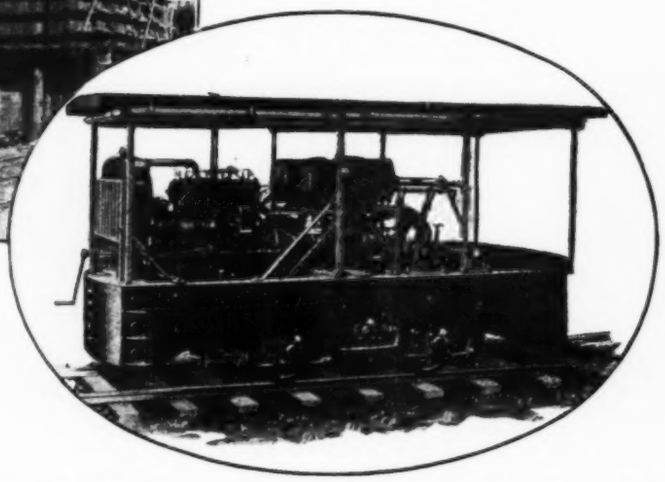
This New Plymouth Locomotive Is Hyatt Roller Bearing Equipped





One of the new model CL Hyatt equipped Plymouth locomotives and Hyatt Lakewood batch box cars in operation on the National Highway near Terre Haute, A. G. Yawger & Company, contractors.

This new addition to the Plymouth line of locomotives—the model CL, 3½-ton—has been carefully designed, carefully built and tested for a year in actual service before being placed in production.

When Fate-Root-Heath engineers selected Hyatt roller bearings to carry the loads in this new size locomotive, they based their judgment on the Hyatt bearing performance in Plymouth locomotives in the past.

Hyatt roller bearings are used on the main journals, the jack shaft, the friction wheel shaft, and the friction disc shaft of this model to reduce friction and promote durable operation.

By building Hyatt roller bearings into their locomotives this company secures for its customers dependable bearing service throughout the life of the locomotives without attention.

If you appreciate the true value of dependable equipment specify that your locomotives be Hyatt bearing equipped.

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USE HYATT BEARINGS ON YOUR LINE SHAFTS TOO BULLETIN 125

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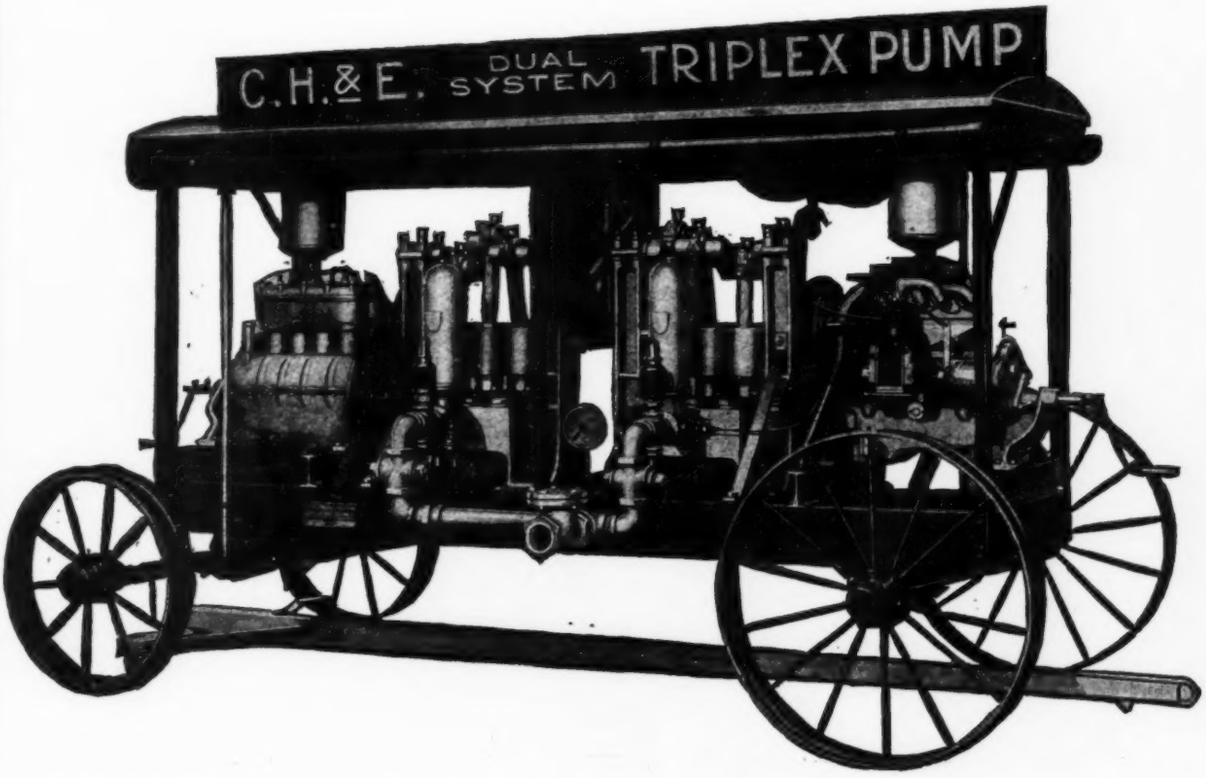
The Advantages of a Dual Pumping Outfit



WATER, as all road builders know, is a most important item on any paving job and to guarantee a constant supply will save the contractor hundreds of dollars each season. The C. H. & E. Dual Pumping Outfit is the latest development in a pumping plant for the road builder.

It consists of two duplicate triplex pumping outfits complete, mounted on a truck, operating independently of each other except that they are piped to a common suction and discharge pipe. This dual outfit is a positive guarantee to the road builder that he will get water at all times. If trouble or any accident occurs to one outfit it can be shut down and the other one immediately started so that the mixer or the work on the subgrade is not delayed a minute.

Write for Bulletin, "Watering Down the Road," describing the complete line of C. H. & E. Power Pumps for every job. Also ask for Bulletins on Portable Saw Rigs, Mortar Mixers, Hoists and Engines.

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Light enough to mount on motor truck or trailer.

Gasoline or electric power—one man operation.

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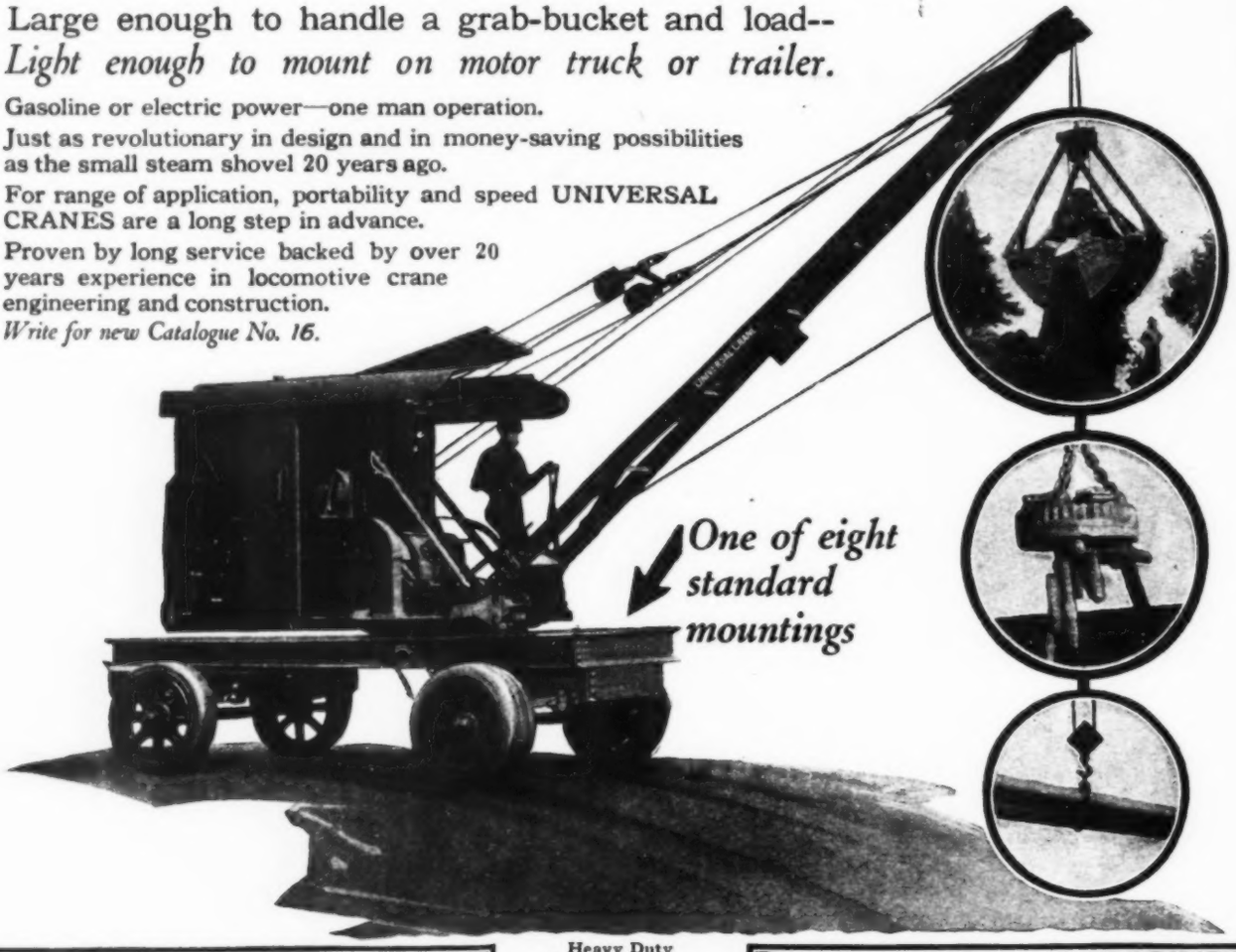
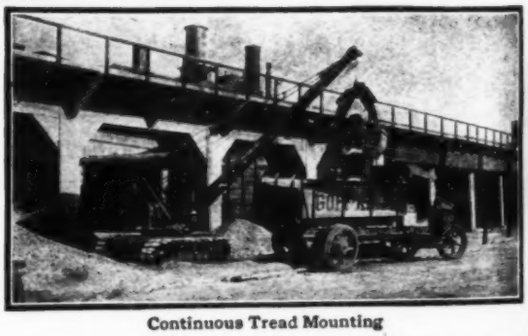
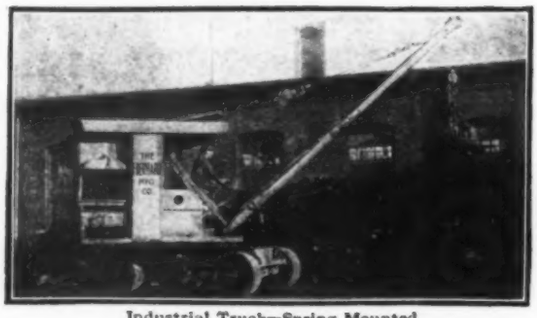


Heavy Duty Trailer Mounting

Motor Truck Mounting



Continuous Tread Mounting



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